

FAST ENGINEERING  
 Contents—p. 51  
 Electric Furnace Brazing—p. 56  
 Union Assists in Time Study—p. 60  
 Fine-Grit Belt Finishing—p. 68  
 Fast Furnace Carbon Hearths—p. 72  
 Wall St. Views Steel—p. 105  
 Martin Report Awaited—p. 108  
 Finished Steel Production—p. 110

DEC 22 1947

The

# IRON AGE

DECEMBER 18, 1947

## Motors Standardized?

**Maintenance men  
say, "NO!"**

WIDELY experienced electrical equipment maintenance men know that motor standardization stops with mounting dimensions . . . that motors are far from standardized in their ability to stand up under trying jobs.

They know, for example, that *Fairbanks-Morse motors* have an exclusive combination of features that add up to extra stamina: Prewound stators with long-lived insulation. Indestructible Copperspun rotors. Crossflow ventilation that bans hot spots. Protection in any mounting position from falling objects and dripping liquids.

For full information on motors that boost production and cut power costs, write Fairbanks, Morse & Co., Chicago 5, Illinois.



## Fairbanks-Morse



A name worth remembering

Diesel Locomotives • Diesel  
 Engines • Generators • Motors  
 Pumps • Stokers • Magnetos  
 Scales • Railroad Motor Cars and  
 Standpipes • Farm Equipment

# JUST IMAGINE!

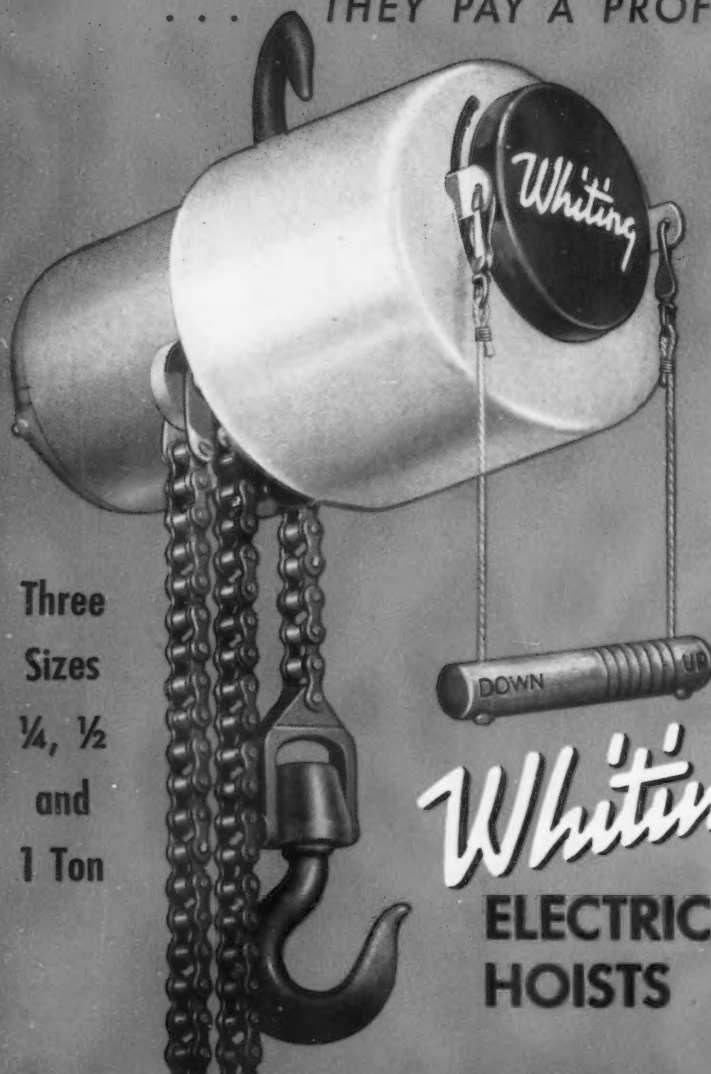
## A ONE-TON WHITING ELECTRIC HOIST for ONLY \$230<sup>00</sup>

F. O. B. HARVEY, ILL.



PROVIDES FASTER, MONEY - SAVING, EFFORTLESS LIFTING

If They Save One Man Only 12 Minutes a Day  
... THEY PAY A PROFIT!



Three  
Sizes  
 $\frac{1}{4}$ ,  $\frac{1}{2}$   
and  
1 Ton

**Whiting**  
ELECTRIC  
HOISTS

No plant can afford to be without these time and money-saving electric hoists. Even when used only a few minutes a day, they pay for themselves in a very few months. Workers are enthusiastic about them, because they make it so easy to handle back-breaking loads.

To install a Whiting hoist, simply hang it up, plug it into the nearest electrical outlet, and it's ready for use. The hoist is so light in weight that one man can install it without assistance. Yet it is rugged enough to stand up under the heaviest duty. Note its features:

- STEEL FROM HOOK TO HOOK
- FEW MOVING PARTS
- ONE-HAND CONTROL
- WEIGHS ONLY 94 POUNDS
- OPERATES WHEN INVERTED
- DUAL-VOLTAGE MOTORS

SEND FOR BULLETIN H-100A

### WHITING CORPORATION

15601 Lathrop Avenue, Harvey, Illinois

- ☐ Send me a copy of your Bulletin H-100A describing the new Whiting electric hoist.
- ☐ Please send me the name of the Whiting distributor in my territory who can give me immediate delivery on a Whiting hoist.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_



# The IRON AGE

Vol. 160, No. 25

December 18, 1947

THOMAS L. KANE

Publisher

R. M. GIBBS

Business Manager

B. H. HAYES

Production Manager

C. E. ELLIS

Promotion Manager

O. L. JOHNSON

Manager Market Research

CHARLES T. POST

Manager Circulation and Reader Service

Executive Offices

Chestnut and 56th Sts.

Philadelphia 39, Pa., U.S.A.

Editorial and Advertising Offices

100 E. 42nd St., New York 17, N.Y., U.S.A.

Regional Business Managers

FRED BANNISTER ROBERT F. BLAIR  
W. Hartford 7, Conn. Cleveland 14  
62 La Salle Road 1016 Guardian Bldg.

C. H. OBER

PEIRCE LEWIS

H. E. LEONARD

Detroit 2

New York 17

103 Pallister Ave.

100 East 42nd St.

B. L. HERMAN

STANLEY J. SMITH

Philadelphia 39

Chicago 3

Chilton Bldg.

1134 Otis Bldg.

JOHN M. HUGGETT

R. RAYMOND KAY

Pittsburgh 22

Los Angeles 28

814 Park Bldg.

2420 Charemya Ave.

Owned and Published by  
CHILTON COMPANY  
(Incorporated)



OFFICERS AND DIRECTORS

JOS. S. HILDRETH, President

EVERIT B. TERHUNE

Vice-President

P. M. FAHRENDORF

Vice-President

JULIAN CHASE

Vice-President

THOMAS L. KANE

Vice-President

G. C. BUZBY

Vice-President

CHARLES J. HEALE

Vice-President

WILLIAM H. YALLAR,

Treasurer

JOHN BLAIR MOFFETT,

Secretary

HARRY V. DUFFY

T. W. LIPPETT

FRED V. COLE

GEORGE MAISWINKLE, Asst. Treas.

Chilton Editorial Board

PAUL WOOTON

Washington Representative

Member, Audit Bureau of Circulation



Member, Associated Business Papers



Indexed in the Industrial Arts Index. Published every Thursday. Subscription Price United States, its Territories and Canada \$8; other Western Hemisphere Countries \$15; Foreign Countries \$20 per year. Single Copy, 35¢. Annual Review Number, \$2.50.

Cable Address, "Ironage" N. Y.

Copyright, 1947, by Chilton Company (Inc.)

## Editorial

A Question of Leadership	53
--------------------------	----

## Technical Articles

Electric Furnace Brazing For Mass Production	56
Solving Common Bandsawing Troubles	59
Union Participation in Methods and Time Study	60
Spot Test Distinguishes Between Stellite and Vitallium	64
Quantometer Speeds Aluminum Alloy Analyses	65
Fine-Grit Lubricated Belt Finishing	68
A Simple Method of Forming Sheet Metal	71
Carbon Hearths for Blast Furnaces	72
Russian Methods for Spot Testing Steel	76
New Equipment	77

## Features

Fatigue Cracks	40
Dear Editor	42
Newsfront	55
Assembly Line	84
Personals and Obituaries	88
Washington	90
West Coast	94
European Letter	98
Industrial News Summary	102
News of Industry	105
Gallup Polls	113

## News and Markets

Industrial Briefs	112
New Construction	114
Fifty Years Ago	115
Tariff Concessions in Metals Field	115
Operating at 150 Pct Above Planned Production	128
Electrostatic Coating Procedures Studied	130
AEC Will Lend Isotopes	132
Canadian Mills Expect More Shortages	134
Machine Tool Developments	136
Nonferrous Market News and Prices	138-39
Iron and Steel Scrap News and Prices	141-42
Comparison of Prices by Week and Year	143
Finished and Semifinished Steel Prices	144
Alloy Steel Prices	145
Warehouse Steel and Pig Iron Prices	147
Ferroalloy Prices	148

Index to Advertisers	197-198
----------------------	---------

# OUTDOORS

# INDOORS

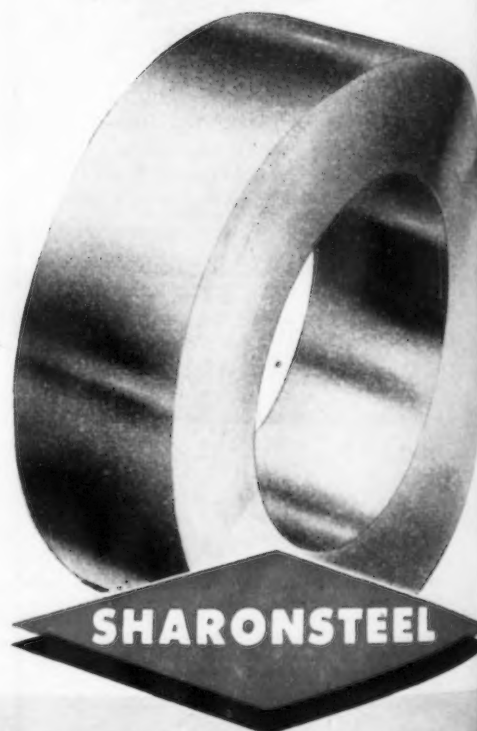


For products that have to withstand hard wear outdoors or indoors, the high quality and instant eye appeal of stainless steel give a decided sales impetus.

The superiorities that have won leadership for Sharon Stainless are the result of precise control from ore to finished product. This gives a strip uniform in gauge and strength, that fabricates easily and has a permanent, brilliant lustre.

Wherever utility and permanent beauty are required, specify Sharon Stainless Steel Strip with confidence. Furnished in coils for long machine runs or in cut lengths, as desired.

**SHARON STEEL CORPORATION**  
*Sharon, Pennsylvania*



**PRODUCTS OF SHARON STEEL CORPORATION AND SUBSIDIARIES:** THE NILES ROLLING MILL COMPANY, NILES, OHIO; DETROIT TUBE AND STEEL COMPANY, DETROIT, MICHIGAN; BRAINARD STEEL DIVISION, WARREN, OHIO; SHARONSTEEL PRODUCTS COMPANY, DETROIT, MICHIGAN, AND FARRELL, PENNSYLVANIA. Hot and Cold Rolled Stainless Strip Steel—Alloy Strip Steel—High Carbon Strip Steel—Galvanite Special Coated Products—Cooperage Hoop—Detroit Seamless Steel Tubing—Seamless Steel Tubing in Alloy and Carbon Grades for Mechanical, Pressure and Aircraft Applications—Electrical Steel Sheets—Hot Rolled Annealed and Cold Rolled Annealed Sheets—Galvanized Sheets—Enameling Grade Steel—Welded Tubing—Galvanized and Fabricated Steel Strip—Steel Strapping, Tools and Accessories.

**DISTRICT SALES OFFICES:** Chicago, Ill., Cincinnati, O., Cleveland, O., Dayton, O., Detroit, Mich., Indianapolis, Ind., New York, N. Y., Philadelphia, Pa., Rochester, N. Y., Los Angeles, Calif., San Francisco, Calif., St. Louis, Mo., Montreal, Que., Toronto, Ont.



190 E. 42nd ST., NEW YORK 17, N. Y.

ESTABLISHED 1855

December 18, 1947

THOMAS L. KANE  
Publisher

T. W. LIPPERT  
Directing Editor

Editorial Staff

News, Markets Editor. T. C. CAMPBELL  
Technical Editor.....W. A. PHAIR  
Metallurgical Editor...E. S. KOPECKI  
Machinery Editor .....T. E. LLOYD  
Art Editor .....F. J. WINTERS  
Associate Editor.....J. R. HIGHT  
Associate Editor...H. W. VAN CAMP  
Associate Editor....E. L. SCHIMKO  
Editorial Ass't. ....A. D. STOUT, JR.

Contrib. Editor.....J. S. LAWRENCE

Foreign Editors

England (Contrib.)....F. H. HARLEY  
49 Wellington St., Strand, London,  
W. C. 2, England  
Canada (Contrib.)...F. SANDERSON  
330 Bay St., Toronto, Canada  
Paris (Contrib.).....PIERRE BENOIT  
59 Rue Manin, Paris XIX, France

Regional News and Technical Editors

G. F. SULLIVAN  
Pittsburgh 22  
814 Park Bldg.

D. I. BROWN  
Chicago 3  
1134 Otis Bldg.

JOHN ANTHONY  
Philadelphia 39  
Chilton Bldg.

EUGENE J. HARDY  
KARL RANNELLS  
GEORGE H. BAKER  
Washington 4  
National Press Bldg.

W. A. LLOYD  
Cleveland 14  
1016 Guardian Bldg.

W. G. PATTON  
Detroit 2  
103 Pallister Ave.

OSGOOD MURDOCK  
ROBERT T. REINHARDT  
San Francisco 3  
1355 Market St.

R. RAYMOND KAY  
Los Angeles 28  
2420 Cheremoya Ave.

Editorial Correspondents

ROBERT MCINTOSH  
Cincinnati

L. C. DEAN  
Buffalo

G. FRAZER  
Boston

HUGH SHARP  
Milwaukee

JOHN C. McCUNE  
Birmingham

ROY EDMONDS  
St. Louis

JAMES DOUGLAS  
Seattle

## A Question of Leadership

A MEMBER of the cabinet, testifying recently before a Congressional committee studying the high cost of living and weighing curative measures, asserted that labor costs were not a controlling element in final market prices. Responding to a suggestion that increased output would place more goods in the market place and that this could be achieved if labor would work longer hours, he insisted that 48 hours of work would produce no more than 40. Prior to his appearance before this committee, the same cabinet member diagnosed the high cost of living as an economic ailment traceable directly to high corporate profits.

These remarks cannot be shrugged off as the aberrations of a politician who under no circumstances will permit the facts to impair his loyalty to a brief. During a similar experience after the First World War, profiteers were castigated as the cause of high prices. The revival of this hoary fallacy serves an obvious purpose. With the aid of such official diagnoses, labor has already announced its program. It will demand another round of wage increases "to meet the higher cost of living."

That such action at this time will serve the best interests of labor is questionable. Nobody is happy about the rise in prices. They pinch many people—the workingman, to be sure, but also great inarticulate white collar, middle-class groups who are always the forgotten people in any inflation. It will compound their hardship and in the long run affect adversely the real income and the security of those very organized workers in whose behalf the demand for higher pay is now being made.

In spite of the doubtful doctrines which emanate from the inner councils of the administration, the fact is that labor cost is a preponderant and often controlling element in prices while profits are a negligible factor. Gross national product in 1945 was \$197.3 billion, net corporate profits, \$9.0 billion, and total interest, net rent and royalties \$11.8 billion. Altogether, property income and the rewards for risk accounted for 10.5 pct of gross national product. Assuming that these relationships prevail during the current year, the total elimination of all rents, royalties, interest charges and profits would account for only 10 pct of the present price level, profits alone for only 4.6 pct. Obviously this is an assumption in a vacuum. Such a drastic economic disenfranchisement of a vital group in the productive process would have a disastrous effect not only on output but the very structure of our society.

On the other hand, the studies of careful students show that over a period of years labor accounts for more than 80 pct of the final market value of output. To argue that rising wages unaccompanied by increased productivity will not affect prices is to say that pouring water in a tight container will not raise its level. There is no mysterious economic alchemy by which labor can extract a greater return for its efforts in terms of real substance unless it works with better tools, greater diligence, for longer hours or some combination of all three. If its leaders at this time insist, in the face of impressive recent experience to the contrary, that higher wages are possible without higher prices, it will be a sorry reflection on the intelligence, integrity and vision of that leadership.

Joseph Stagg Lawrence

# Under his Watchful Eye

... 6 open hearths



This is Larry McCoy, 34, melter at Inland's No. 2 Open Hearth. Larry started as a laborer in 1936, and in ten years moved up from third, second, and first helper, to melter. He's now responsible for the quality of 1600 tons of Inland steel every day.

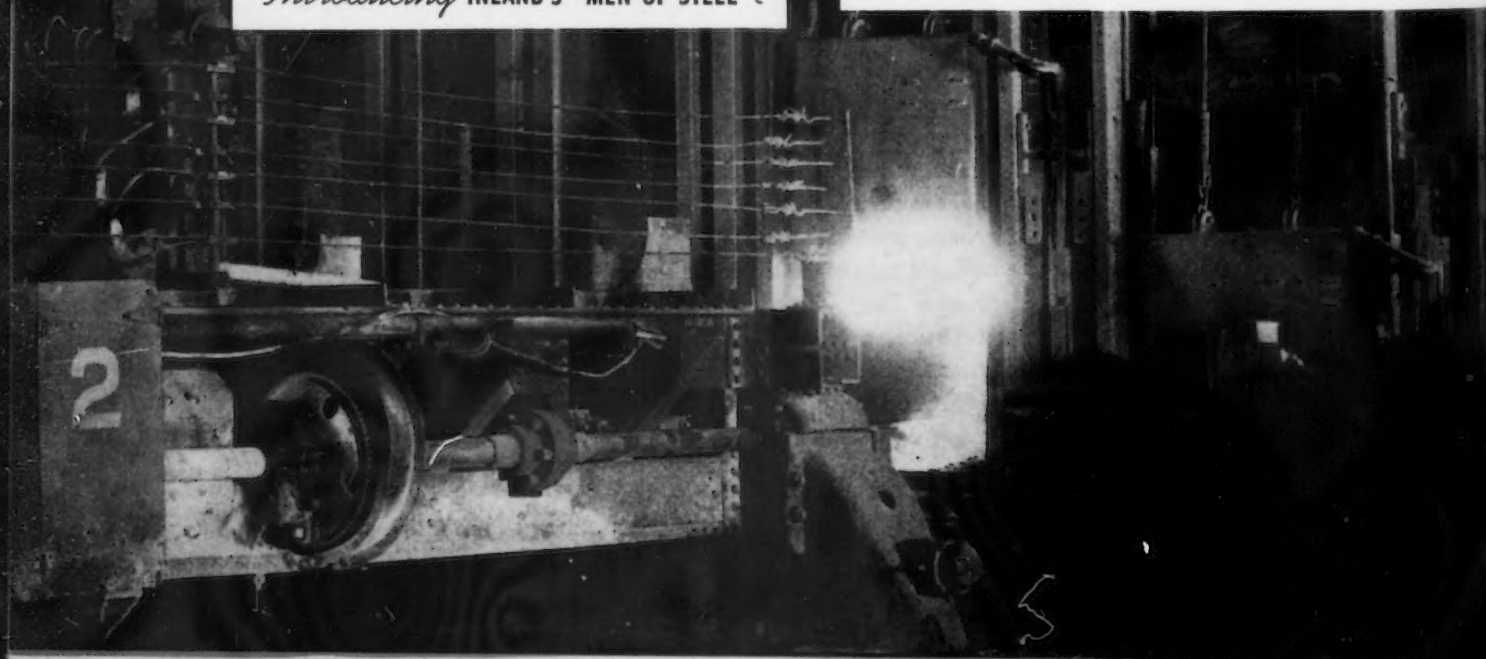
McCoy is another of Inland's capable, conscientious men, who have learned steel-making from the bottom up. The skill and judgment of these men is reflected in every ton of Inland steel.

INLAND STEEL CO., 38 S. Dearborn St., Chicago 3, Ill.  
Offices: Detroit, Indianapolis, Kansas City,  
Milwaukee, New York, St. Louis, St. Paul.



BARS • STRUCTURALS • PLATES • SHEETS • STRIP • TIN PLATE  
FLOOR PLATE • PILING • REINFORCING BARS • RAILS • TRACK ACCESSORIES

*Introducing* INLAND'S "MEN OF STEEL"





► Based on filters developed for Army and Navy vehicles, A. C. Sparkplug has developed a new oil filter which is expected to contribute to increased life of automobiles. The filter uses an acid-proof seal made of glass cloth.

► Confusion is again the word for the freight car steel supply picture. Car-builders think they are going to get one tonnage figure, steel producers understand it to be a different one. While the expansion of steel orders for repair is hardly ironed out, proposals for boosting output 50 pct are clouding the picture still further.

By the time present orders are filled, high-strength low-alloy steel will have been used in the construction of about 100,000 freight cars.

► Industry sources believe that Russia has the means of producing an atomic bomb, and will demonstrate one within the following year. Industry sources have been unable to convince the U. S. government, however.

► Lima Locomotive will build its initial diesel locomotive which is expected to be completed the latter part of next year. The first unit will be a 1000 hp locomotive, and the second will be of 660 hp.

► Inability of British steel rerollers to get low priced semi-finished steel from France and Belgium will change the rerollers' plans for the future. Important firms in this line are now planning to go into steelmaking at some time in the not too distant future.

► Another approach to greater motor vehicle economy is through the use of lower grade fuels whose octane ratings have been stepped up by the use of a low cost additive. Experiments on a truck and bus fuel are said to have stepped up the rating from 60 to 78.

► Upwards of 600,000 tons of air raid shelter steel in Britain have been re-claimed since the war, and it is estimated that there are 300,000 tons remaining. The government hopes to complete the collection project by the end of 1948.

► Recent orders for concrete reinforcing bars for Turkey have been priced at \$140 c.i.f. Istanbul. Tinplate quotas for Turkey are now to be imported by government authority only.

► While the modernization program in the French steel industry is progressing slowly, and will be scarcely effective from a production standpoint next year, it has already effected important manpower savings. The production above 1938 levels achieved in October was accomplished with about 20,000 less workers than was the 1938 average.

► Because of the high costs of doing business far away from the basing points many steel firms are still withdrawing from some areas. Some are turning away customers who have been on their books for years.

This action is forced on the steel companies because of the financial angle, but is not sitting too well with some steel consumers. As a result customer relations of some steel companies are being seriously affected.

► Attempts to hold down scrap prices by suasion and reference to old time OPA ghosts of formulae so far have been a lot of words. What has kept the price down has been the absence of buyers from the market.

When someone breaks loose the real test will come. The market is still on a supply and demand basis, is thin, and the future trends can mean a serious blow to steel making costs if the past is repeated.

► Another new steel gray market twist is for distributors of electric ranges, refrigerators, heating plants, etc., to pay premium prices for sheets and turn them over to fabricators in exchange for scarce consumer items.

► The aluminum ingot production situation hinges on cheap power, just as it always has. If domestic producers could get a dependable source of cheap power, they would start building new ingot capacity immediately.

► Capacity of metalworking plants in the South, from the Carolinas to Texas, is said to have increased 75 pct since 1939. This growth, much of it born of the war, is said to be continuing in the postwar period.

# Electric Furnace Brazing For

*Utilization of a continuous, controlled-atmosphere, electric furnace for copper brazing, silver soldering and bright annealing of a variety of products is described in this article. Flexibility of the furnace is indicated by illustrations of a variety of sizes and shapes of parts produced, varying from a fraction of an ounce to several pounds in weight. Close temperature control, economy of operation and improved quality of product are features emphasized by the author.*

**C**ONTINUOUS brazing furnaces have been usually associated with mass production of one individual part or product. Manufacturers with highly diversified production have been inclined to consider this type of furnace as too expensive for their needs, inasmuch as in the past such units have been confined more or less to special operations. The present day electrically-heated furnaces capable of copper brazing, silver soldering and bright annealing, however, are being used in the production of a variety of products incorporating many various shapes and sizes of assembly. Furnaces for brazing are available in a wide range of sizes,

varying from small 24-in. long by 12-in. wide units to large 40 to 50-ft long units.

A newly-designed brazing furnace has proved very flexible and has been used successfully to copper braise, silver solder and bright anneal assemblies weighing as little as a fraction of an ounce, to those weighing several



Weight of the copper brazed assembly used in Shavemaster (above, left) is 0.2 oz. A liquid copper brazing solution is painted on the area of the clip which is later brazed to the larger part. In producing the Clipmaster (above, center) the wing set screw is copper brazed from two sections. The electric brazing furnace is also used for silver soldering, as in the case of the Rain King hose nozzle (center, right). The screw cap and stem are produced separately from high strength brass bar stock and then silver soldered.



# Mass Production



FIG. 2—In producing the Mixmaster (above, right), the entire base is assembled by brazing. The bright sheen of the brazed base illustrates the protection given by the furnace atmosphere. The electric continuous furnace is also used for bright annealing the Rain King sprinkler base (above, left) during forming. This base requires no further cleaning before the final surface treatment is applied.

pounds. In addition, the unit requires little downtime for furnace changeovers. This allows a manufacturer with diversified products to use but one furnace for his entire production requirements with equal success, reducing nonproductive hours, and justifies its installation from an economic standpoint. The quality and adaptability of brazed assemblies to modern design makes a flexible brazing furnace of this type highly advantageous for high quality, quantity production.

The electric brazing furnace used in the production of Sunbeam appliances has elements

located above and below the conveyer. Close temperature control of  $\pm 10^\circ\text{F}$  max and even heat distribution obtained by this design are essential for quality brazing. The furnace heating chamber is 20 in. wide by 8 ft long and is able to handle assemblies having a maximum height of 12 in. The furnace cooling chamber has a total length of 24 ft, and is equipped with sectional water jackets. The work is conveyed through the furnace on an alloy woven wire belt of sufficiently fine mesh to handle the smallest assemblies. Belt life averages 6000 hr. Charging and discharging of the work is done automatically or manually, depending on the shape and quantity of the assemblies being brazed. Very small parts are sometimes conveyed through the furnace on trays, and complex assemblies are usually assembled by

By HENRY EICKELBERG

Metallurgical Engineer,  
Sunbeam Stewart Industrial Furnace Div.,  
Sunbeam Corp.,  
Chicago

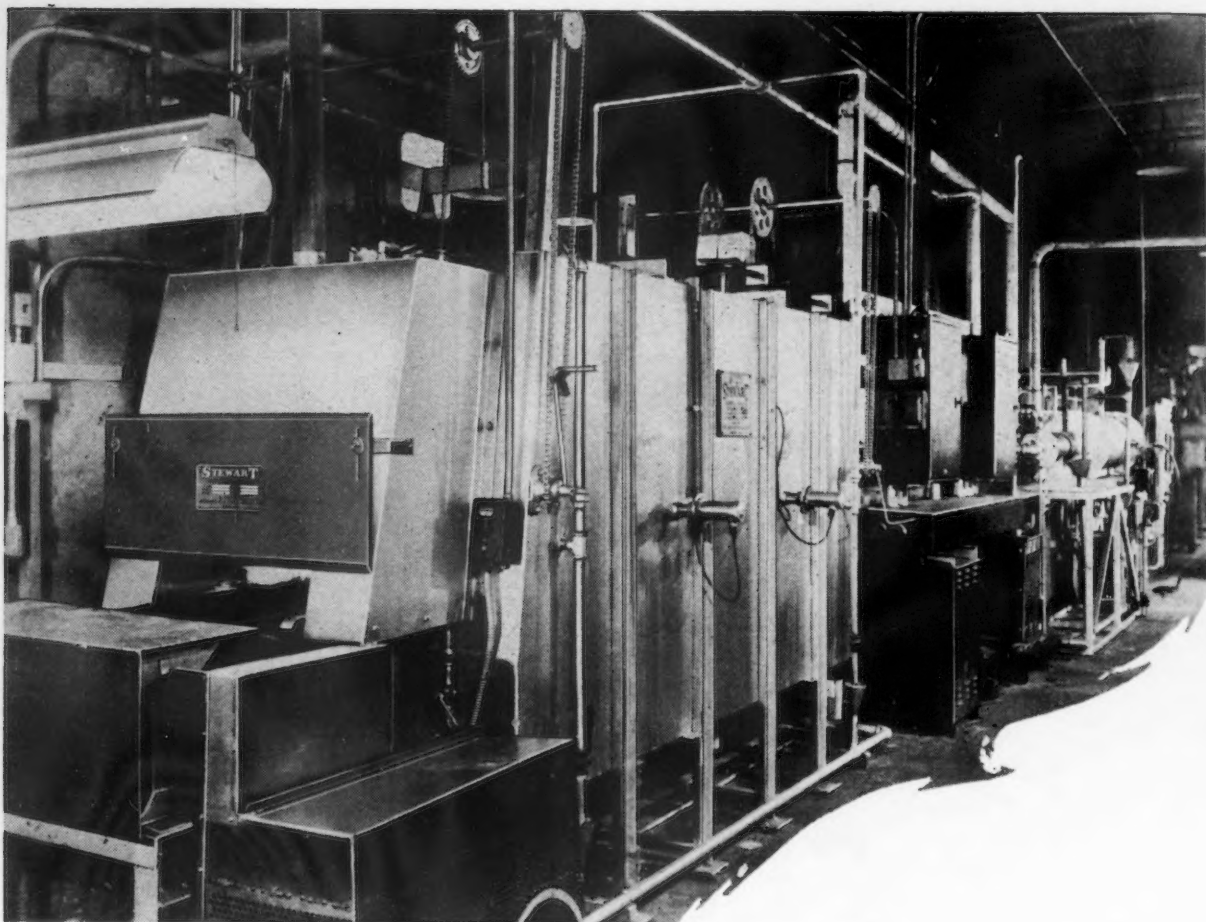


FIG. 3—End and side view of the electric, continuous brazing furnace. The unit is used for copper brazing parts that go into the assembly of several widely used domestic products. The atmosphere generator is at the extreme right.

spot welding before being placed into furnace. Spot welding prevents misalignment of the various parts.

The atmosphere required for successful brazing is supplied by a Sunbeam-Stewart gas cracking unit equipped with a turbo-type, air-gas mixer. This type cracking unit is completely automatic in its operation and does not require close attention by the operator. An 800-Btu gas is used and the mixture of air to gas is  $3\frac{1}{2}:1$ .

Flexibility of present day brazing furnaces is primarily due to the supply of a sufficient quantity of externally generated gases of controlled composition and the ability to accurately control the heating and cooling cycle within close time and temperature tolerances. All other considerations are of a mechanical nature and offer little difficulty.

Fig. 3 shows an end and side view of the copper brazing furnace employed in the production of Sunbeam appliances. The charge end shows the flame curtain employed to burn excess atmosphere gases. A flame curtain is also employed on the discharge end of the cooling chamber to prevent the escape of gas outside the furnace proper. The furnace is entirely self-contained and requires a minimum of floor space. No obnoxious fumes escape to affect employees working in the immediate vicinity, and the unit is sufficiently insulated to reduce radiated heat to a minimum.

Typical copper brazed assemblies in the manufacture of appliances are Shavemaster side plate (fig. 1). Total weight of this assembly is 0.2 oz. This lightweight assembly would be impossible to produce in quantities at a reasonable cost by any other method than brazing.

Two entirely different assemblies, Fig. 1, are used in the animal clipper. The wing set screw is copper brazed from two sections, allowing the use of an automatic screw machine part and a stamping, which results in reduced machining and material cost, as well as assuring consistent, high quality products. The wing set screw was previously made from a forging at a considerably higher labor and material cost, with results inferior to the set screw illustrated. The cover plate of the Clipmaster also illustrates the use of simple stampings and screw machine parts incorporated into one rather complex assembly. The threading and machining can again be handled by automatics, and the plate accurately stamped, thus replacing a forging or casting with a superior product made possible by continuous copper brazing.

In the manufacture of Mixmasters, see fig. 2, the entire base is assembled by copper brazing. The five tubular legs are positioned and temporarily spot welded; copper slugs are then dropped into the tubes. The two bushings are positioned and rings of copper wires dropped over them. The base is then ready for the braz-



ing furnace. Spot welding is recommended for temporarily holding difficult assemblies in position. A very light weld is all that is required. The bright sheen of the brazed Mixmaster base assembly shows the perfect protection afforded by the controlled atmosphere generated. This base is shown exactly as it was discharged from the furnace; no evidences of discoloration are noted. In fact, some reduction of previous oxidation may have taken place.

The various shapes and sizes of assemblies shown were all brazed in the same furnace on a continuous production basis, illustrating the adaptability of one furnace to various products.

Although copper brazing is done at a temperature of approximately 2050°F, this furnace is also used for silver soldering, which requires temperatures in the neighborhood of 1200°F, with equal success (the minimum operating temperature of the furnace is 800°F). The production of Rain King Nozzles (fig. 1) is an example of this type of production. The screw cap and stem were formerly made from a one-piece casting, again incurring high material and labor cost. Quality was improved and costs were reduced by producing the stems and caps separately from high strength brass bar stock, and joining the two sections by silver soldering.

After having observed the bright finish obtained at various temperatures, the furnace was put into use for bright annealing the Rain King sprinkler base between drawing operations. The high quality results obtained are shown in fig. 2. The finished base is scale-free and requires no further cleaning before the surface protection is applied.

Availability of this equipment as a continuous production unit varies from production of 50 lb up to 1000 lb per hour. The conveyor speed of the automatically-driven carrier belt ranges from 10 to 40 ft per hour. The belt is driven from the charging end of the furnace. Each unit is equally flexible in handling various materials, the only restriction being the actual size of the assembly which can be introduced into the heating chamber of that particular furnace.

Cooling chambers are normally approximately three times the length of the heating chamber. These cooling chambers, when adequately water-jacketed, will cool the work sufficiently to allow removal from the protective atmosphere without adversely affecting the surface.

The present day brazing furnaces have advanced to the point where designers can utilize to the fullest extent the simplicity in design and manufacture of brazed assemblies.

## Solving Common Bandsawing Troubles

THE recognition of the effects of most bandsawing difficulties frequently points the way to simple adjustments for their correction. The DoALL Co., Des Plaines, Ill., has listed many of the common troubles, along with corrective recommendations.

Difficulty	Remedies
Negative camber developing in blade.	Saw blade riding too heavy on saw guide back-up bearing. Adjust blade for alignment on top and bottom wheels.
Positive camber developing in blade.	(1) Feeding pressure too heavy. (2) Use coarse pitch saw to permit greater tooth penetration. (3) Saw guides too far apart. Adjust closer to work.
Blade developing twist.	(1) Saw binding in cut. Decrease feeding pressure. (2) Side inserts or rollers of saw guides adjusted too close to saw. (3) Wrong width blade for radii. (4) Decrease saw tension.
Premature dulling of saw.	(1) Lower saw velocity. (2) Apply proper coolant when cutting ferrous and nonferrous materials. (3) Keep saw teeth engaged. Do not allow the teeth to idle through cut. Increase feeding pressure. (4) Apply coolant at point of cut, saturating teeth evenly when cutting ferrous and nonferrous alloys. (5) Be sure saw is running with teeth pointing down.
Premature loss of saw set.	(1) Saw set too wide for radii being cut. (2) Reduce saw velocity. (3) Introduce coolant when cutting ferrous and nonferrous alloys.
Saw vibrating in cut.	(1) Increase or decrease saw velocity depending on material being cut and work thickness. (Consult Job Selector). (2) Increase blade tension. (3) Use finer pitch saw. (4) Increase feeding pressure.
Saw teeth ripping out.	(1) Use fine pitch saws on thin work sections. (2) Eliminate vibration by holding work firmly while being fed into saw. (3) Use coolant on ductile materials. (4) If gullets are loading, use higher viscosity lubricant or coolant. (5) Reduce feed pressures.
Premature saw breakage.	(1) Gage of blading tool heavy for diameter of wheels and speed of machine. (2) Cracking at weld. Try longer annealing period, decreasing heat gradually. (3) Saw pitch too coarse. Decrease unit load by using finer pitch saw. (4) Decrease feeding force. (5) Decrease saw tension.

# Union Participation In

By R. T. WALTON  
Industrial Engineer  
Oliver Iron & Steel Corp.,  
Pittsburgh

ORGANIZED labor, which has long sought a niche in management's planning, has reached a part of its goal in one instance—and this on the initiation of management rather than the union. Any plant which bases its production on mechanical operations controlled by individual operators must sooner or later resort to time and method studies to determine production efficiency, production control, scheduling, relative costs and analytical reporting of method improvement and procedures.

Nearly 7 years ago Oliver Iron & Steel Corp. came to this conclusion and established the beginning of a continuous study of operations on this basis. An immediate and long standing problem of industry faced this effort, as it has in hundreds of other instances—the problem of organized labor's suspicion of specialists who stand over operations with stop watches and charts. This was apparently a hangover from a former aversion to piecework which undoubtedly had been abused by some companies.

Aware of this problem, the Oliver methods and time study department opened its doors at its inception to the employment of a union member and began a training program which would allow this union representative to work hand in hand with trained time study men, thus providing a labor-management teamwork basis which, to the writer's knowledge, had never been done before.

This must not be misconstrued as a policing measure on the part of the union, for management is firm in its stand that managing is still management's responsibility. However, time study, when practiced on a joint basis, has the effect of creating a mutual understanding of problems rather than suggesting policing on either part.

The plan, which was suggested by the management, was so favorably received by the USW-

CIO that an agreement of this kind was included as a supplement to the corporation's 1940 wage agreement and since 1941 has been a standard part of the contract.

In the beginning only one union representative was required by the department to create a balance in the labor-management personnel. Since then the department has grown to require four union men who work in study teams with four management representatives. These union men are especially trained by the department in time and method study practices, supplemented by night classes at the University of Pittsburgh, so that they are equally competent to judge efficiency of operations and are given an equal vote in decisions relative to study results. Management, naturally, retains the prerogative to make final

decisions, but in the 7-year history of the function, only one case has ever gotten beyond mutual agreement.

The mechanics of selecting union members for such departmental methods and time study work is as follows: The job opening is posted on the plant bulletin boards and the union is requested to recommend three suitable applicants for

the position. These applicants are then selected by management by reason of former education, responsibility, employment record, attitude, adaptability and other human factors. A newer method, more recently being tested, is a screening test given to all applicants by the Methods Engineering Council, a firm which specializes in aptitude work.

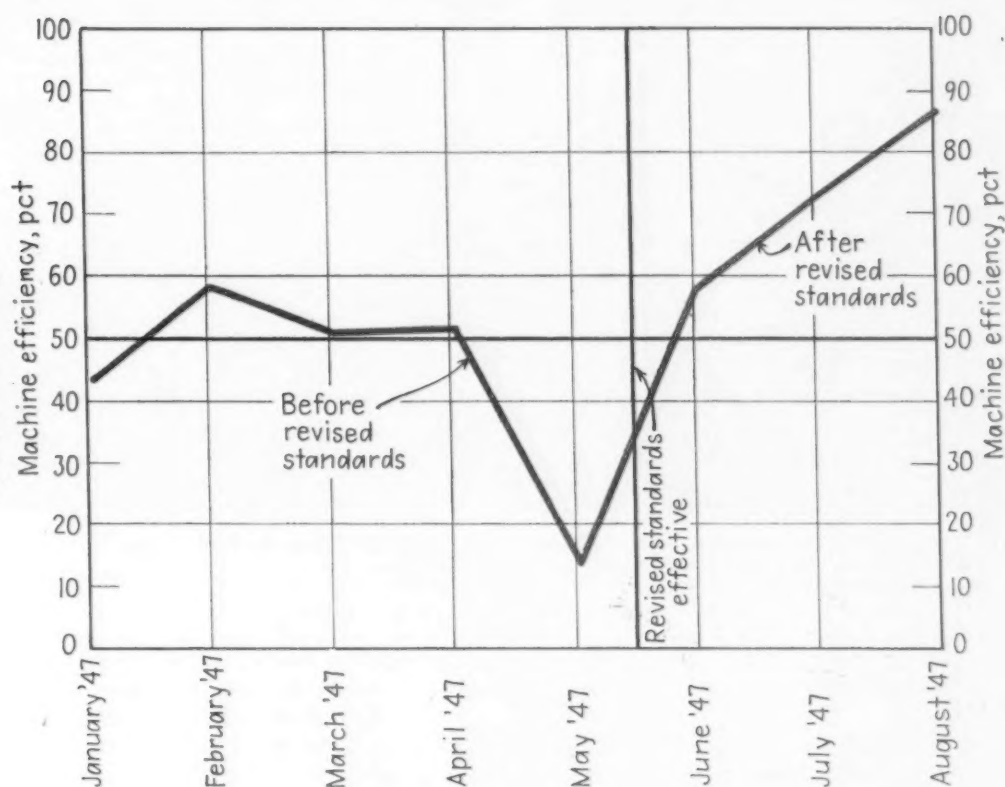
A number of means are used in training new union employees of the time and methods department so that they can quickly grasp the fundamentals of time study and become an active part of the joint study teams. Part of this is done by actual on-the-job training on various plant operations working directly with a trained time study man. This is supplemented by lecture

***A report on a highly successful plan of full-scale union participation in the methods and time study department of a large metalworking plant is presented in this informative article. The author explains the management's thinking in inaugurating this plan, and tells how it functions. Some pertinent comments on the fundamentals of effective time study and methods of work are also given.***



# Methods and Time Study

FIG. 1—Revising of standards on a 1/4-in. National Bolt-maker to give proper allowance for nominal delays resulted in a substantial improvement in machine efficiency, as indicated in this graph.



courses on company time and also special training films produced by Ralph M. Barnes, Professor of Industrial Engineering, University of Iowa, and by Methods Engineering Council. These films show simple operations being accomplished at measured rates of speed and the student employee is enabled to record his judgment of these speeds and later check against the actual figures. The new union employees are requested to participate in night classes at the University of Pittsburgh or at Carnegie Institute of Technology in industrial engineering courses. This program was originally intended as a means of educating the department's employees. However, since a better understanding of time study methods all through the work force is valuable in helping workers to comprehend the complexities and justness of unbiased time study and method development, it has been extended to other groups in the past several years.

Gradually, the time study educational program is being extended to foremen of all departments, union shop stewards, grievance men and union officials, and will eventually be extended to all levels of employment through the union halls if this proves desirable.

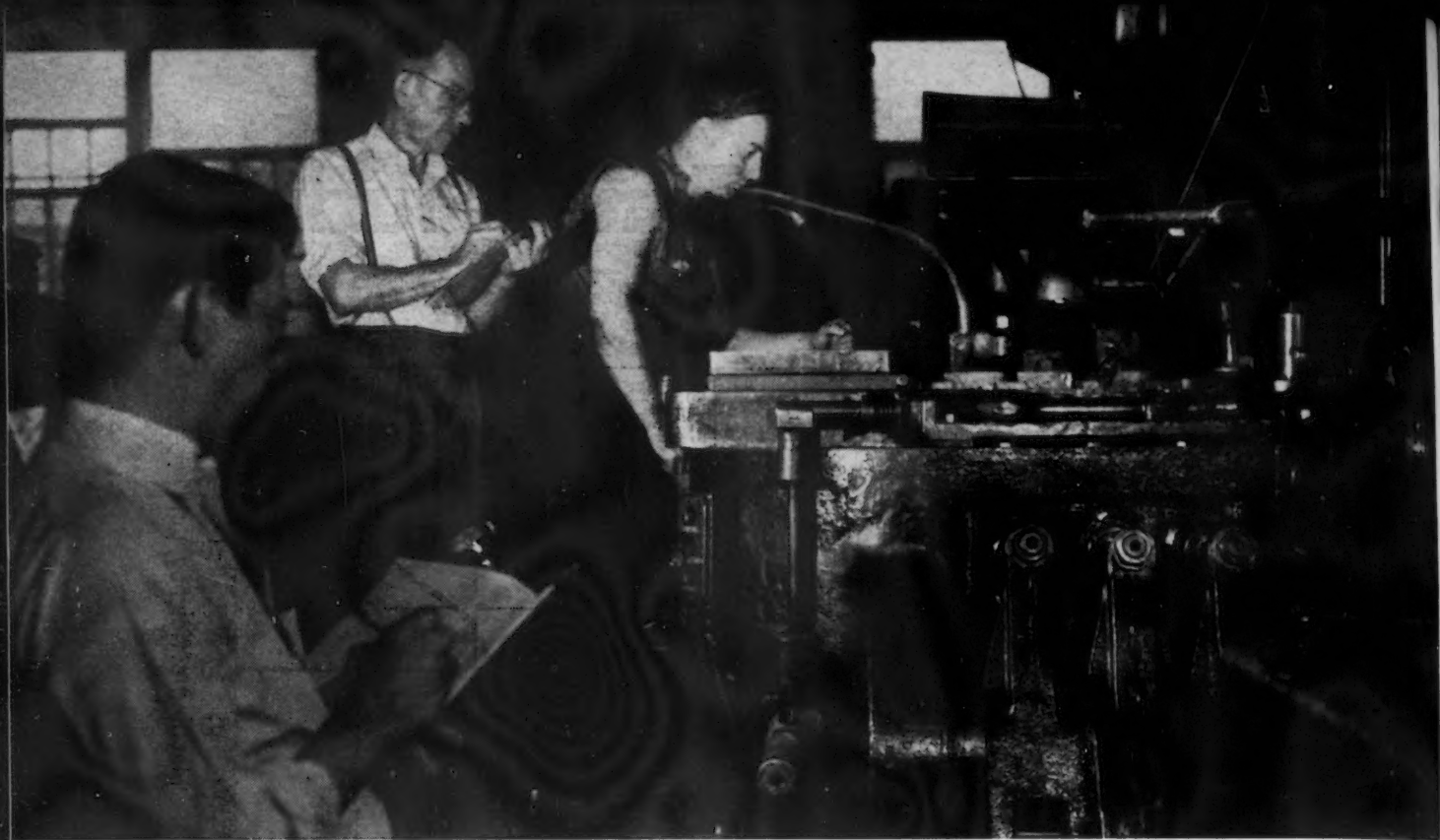
The popularity of joint labor-management co-operation on basic planning problems has spread considerably in the history of this experiment

and the present union contract at Oliver Iron & Steel Corp. also includes joint labor-management participation in the safety and health program within the plant and the job evaluation program.

Time study of the Oliver plant is by no means complete, but has been about 60 pct completed with excellent results for both labor and management. While no operation-by-operation check has been possible, it can be said that through a combination of incentives, job training and methods changes, mostly suggested by original time studies, individual production increases of over 50 pct are being frequently recorded.

Some immeasurable part of this increased production can undoubtedly be charged to better employee attitude because the individual Oliver employee has come to know that time study is a fair method and one which is practiced to the mutual satisfaction of the union and the management.

The fact that production has increased on many operations is a favorable sign to management that time study and its related activities is a worthwhile effort. However, the gains are not one-sided as the operators on incentive jobs have increased earnings to a point that men on jobs not yet rated are beginning to insist that the studies be completed and standards set on their jobs. But even the union realizes that at this



**FIG. 2**—Typical of the union-management cooperation in establishing time standards is this illustration of studies being made of a boltmaking operation.

point such a program takes time and that everything possible is being done to make the study complete.

Job classification has also been put on a joint labor-management basis at Oliver Iron & Steel and has been carried well toward completion with excellent cooperation. Of some 1500 plant workers, about 1081 job classifications have been made to date. Of these, 103 have been cancelled as temporary or duplications, and over 900 have actual classifications so far as point value but not dollar value. This program, along with other joint labor-management programs, can safely be termed highly successful and it is possible that a national trend to this type of labor relations will evolve throughout industry. The major corporations in the heavy industries have been quick to pick up every feasible method for dealing with labor. While it is felt here that Oliver Iron & Steel Corp. has perhaps pioneered a little, it is also hoped that this small effort will find its place in solving the age-old labor-management problems.

A specific example of the benefits that can accrue from proper use of wage incentives is that involving performance of a line of Bolt-makers. The time study problem for this line of automatic Boltmakers dealt with the fact that machines (see fig. 2) presumably capable of operating 100 pct actually operated at only 45 pct of the available machine hours, after the installation of an incentive plan which did not include allowances for getting the machines into operation after a shutdown. The operators earned 18 pct bonus on this wage incentive plan. Time studies showed that the guaranteed hourly rate for normal shutdowns gave the operator little incentive to get the machine back in operation.

After making time studies and surveys, involving 26,880 machine hours, an incentive plan was developed which encouraged as nearly as possible full operation of the machines. Through this plan machine efficiency was increased to 60 to 70 pct for the line and over 80 pct for the  $\frac{1}{4}$  in. National Boltmaker, as shown in fig. 1. Worker bonus increased to 38 pct of a possible high of 49 pct. This is but one example of how time studies can increase production and worker take-home-pay without increasing unit labor costs.

Wage incentives are not, and never were, intended to replace good supervision. It is only a tool to be used by management and supervisors to control costs and establish production standards for individuals or groups. Standard requirements are established for lengths, sizes, material specifications, etc. A foreman or supervisor utilizes past performance as a basis of establishing production standards for that is his only yardstick in determining a fair day's work of an employee. Time studies have proved operator performance varies between 60 pct and 80 pct activity on the jobs that are unmeasured.<sup>1</sup> This yardstick, in the form of standard production performance in the hands of a foreman, should be just as valuable and accurate as his material or product specifications. It does not follow that once a standard performance is established that employees will meet or exceed the standard without too much supervision, in any greater degree than they produce products to meet inspection standards. The more familiar a foreman is with his products and specifications, the better control he has in correcting deviations from specifications. It is axiomatic that this principle applies to time standards.

Time study is a method of collecting facts.



Essentially its aim is to put it on a plane of scientific exactness to be able to determine fairly a normal day's work. The normal operator, not

<sup>1</sup>"In general, increases in productivity over past performance were found to average 60 pct when wage incentive plans were applied to individual workers and based on time study."—Management Consultant Div., WPB, 1944.

being trained in motion economy principles, does the job as instructed nine times out of ten by another operator. He does the job to the best of his ability during the time he applies what he considers the correct amount of effort. It is the purpose of the industrial engineering department to determine the standard method and time for an operator to perform a fair day's work as defined later. It has been the personal experience of the writer in installing thousands of time standards that men say it is impossible to meet the time standards established, then proceed to exceed them. Who is better qualified to say what a time standard is for any one operation? A man with an opinion or a man with facts?

Organized labor is pressing constantly for a fair day's pay. Management must stress a fair day's work for a fair day's pay. Time studies bring to light conditions where management has not been consistent in establishing work loads, resulting in sporadic activity by individuals, and the inevitable claims of inequities in defining a fair day's work. Oliver Iron & Steel is attempting to answer labor's claim for a fair day's pay in this evaluation program by evaluating the requirements of skill, effort, responsibilities and working conditions for each job classification. The corporation will and does pay more than a fair day's pay for more than a fair day's work through the medium of the wage incentive plan in effect. The definition of a fair day's work is very controversial. However, the definition used here is as follows:

*"A fair day's work is the amount of work that can be produced by a qualified employee effectively using product, materials and equipment, working at a normal pace the full scheduled hours except the normal personal time required established by time study."*

Wage incentives are a recognized part of the industrial world. It is a medium of recognizing individual performance. It is also a means whereby the individual can get personal and financial satisfaction for doing a good job. Inherently, the American worker is competitive. Wage incentive is one answer to that need.

TABLE I

A Partial List of Operations on Which Standards Have Been Installed

Treating wire	Threading bolts
Pressing nuts (cold)	Heat treating
Pressing nuts (hot)	Galvanizing
Heading bolts (cold)	Assembling
Heading bolts (hot)	Nutting
Dressing nuts	Packing
Trimming bolts	Drop forgings
Tapping nuts	Making dies

A wage incentive system to operate successfully, must follow certain basic principles:

(1). There must be proportional reward for increased production.

(2). Time standards should not guarantee incentive wages nor establish a ceiling on earnings.

(3). The time standards must be based on facts, fair and attainable by qualified employees.

(4). The time standards once established and accepted must not be changed because an employee is exceeding the task. The only time the standards should be changed is when work requirements are changed from those established by studies.

(5). Time standards revised because of method changes should permit qualified employees to earn equivalent wages corresponding to previous earnings.

(6). Idle time must not be paid at incentive rate, but incentive earnings should not be nullified by conditions beyond the operator's control.

(7). Employees working on incentive wages should be rewarded with corresponding wages for cooperating during experimental stages of methods improvements.

(8). All employees should be familiar with work requirements and methods utilized in computing incentive earnings.

(9). Management should be familiar with work requirements, the mechanics of establishing a time standard and the methods utilized in computing incentive earnings.

(10). Wage incentives must be administered by experienced, fair-minded, competent men qualified to take proper action without being pressured into expedient temporary measures.

Good wage incentives cannot and should not substitute for good basic wages; neither can they substitute for good management; but they can add substantially to good wages and effectively support good management.

Taking the normal level of production as 100 pct base, the first week after the A-bomb fell on Hiroshima the employees at Oak Ridge, having learned the full meaning of their efforts, doubled production. The week following, when the second bomb fell on Nagasaki and they could begin to see that they could help bring the war to a quick close, it went up to 300 pct of the original level. This is a concrete example of performance without an incentive.

The difference between present clock punching day-work performance and reasonable alert and intelligent cooperation on time standards established by time studies, is from 10 to 50 pct of present productivity. Couple this with payrolls ranging from \$2 million to \$100 million annually and it can be seen that the condition is one which can make many hundreds of thousands, even millions, of dollars a year difference in national income for higher standard of living. Where else can management, without buying any new machinery, building any new plants or selling any additional products, expect to obtain means for paying high taxes, high wages and dividends?

Some facts that wage incentives do not fully cover, but which are covered by other staff functions, are:

The only source of real income is increased production; that increased income that does not arise from increased production is quickly lost through increased living costs.

One source of increased production is in-

creased efficiency of the individual worker; by far the largest source is increased efficiency of the machine. Increased production accomplished by placing in the hands of the worker a machine that will enable him to increase his output without additional physical effort, discomfort or hazard to his safety, is real increased production that produces additional income, keeping income, take-home income for everybody concerned, particularly for two men, the man who owns the machine and the man who runs it.

As a conclusion to this discussion, reference is made to a survey made by the Chicago Chapter of the Society for the Advancement of Management, on the attitude of labor unions to scientific management. A good majority of about 45 labor leaders who answered questionnaires, or were interviewed, have the following opinions:

- (1). Production standards should be set by time and motion study.
- (2). Wage rates should be established by job evaluation.
- (3). Group life and health insurance plans should be increased.
- (4). Industrial relations programs should include recreational activities.

Difficulties between management and labor leaders probably hinge on more specific details than on the broader objectives. At Oliver Iron & Steel Corp. an effort is made to go into those specific details thoroughly, not always agreeing 100 pct, but at least resulting in a better understanding of the mutual problems of labor relations.

Excerpts from labor contract covering union participation in the time study department. From 1946-47 contract: Oliver Iron & Steel Corp.—United Steelworkers of America, CIO local 1736.

(1). The union shall be represented in the time study department by no less than one member, who shall be a regular employee of the corporation. He may be replaced upon request of the union within 15 days written notice (unless otherwise mutually agreed upon by the parties) to the corporation at which time he shall be reinstated in his job with all rights. Union members of the time study department will be subject to the same rules of supervision and administration as other time study employees.

(2). The corporation hereby agrees that once each quarter during the life of this agreement the supervisor of the time study department will review with the local union (president of the local union, chairman of the grievance committee and union time study observer) his plans for time studies for the succeeding quarter. All reasonable recommendations by the union with respect to future time studies will be given serious consideration by the corporation. This quarterly review, however, shall in no way be intended as a limitation on the right of the corporation to administer and to supervise the time study department.

(3). The present procedure of joint participation in the establishment of standard hour incentive performance requirements by union and management shall continue during the term of this agreement. However, either the corporation or the union may require negotiations for elimination or modification of these procedures upon 30 days' written notice to the other.

## Spot Test Distinguishes Between Stellite and Vitallium

**I**N A recent paper, Badger and Kroft<sup>1</sup> described several etching reagents for certain Haynes Stellite alloys, including the cast alloys Vitallium and Stellite No. 23. The two alloys, when cast as turbine blades, are similar in appearance. According to Louis Silverman, Los Angeles, it is possible to distinguish between the two alloys by a single, rapid spot test. The test is based on a difference in chemical composition, the Vitallium containing molybdenum (5 to 6 pct) and the Stellite No. 23 containing tungsten (5 to 6 pct).

The test is based on the rose color which molybdic acid forms with sodium thiocyanate and stannous chloride. None of the elements, tungsten, chromium, cobalt, nickel, manganese or silicon, respond to this test, but alloys which contain molybdenum (Vitallium, molybdenum steels and certain molybdenum alloys) will give positive tests. Therefore, this spot test is to be applied to metal surfaces having the physical appearance of Vitallium or Stellite No. 23. The

established that Stellite No. 23 may contain up to 1.5 pct Mo and still be distinguished from Vitallium, using the spot test described.

The rose color is ascribed<sup>2</sup> to the formation of  $H_2MoO_4(CNS)_3$ .

It is advisable to first run a preliminary test on known samples of Vitallium and Stellite No. 23. The test procedure is as follows:

(1) Position the sample and select a level spot for the test. Rub the spot free of grease and dirt with a cloth.

(2) Place only one drop of 30 pct hydrogen peroxide on the spot.

(3) Cover the hydrogen peroxide with one drop of concentrated hydrochloric acid (sp gr 1.2). Allow to react for 2 min; a green color (cobalt chloride) forms.

(4) Place the metal over a 50 ml beaker, and wash the green solution into the beaker with a

\* Thirty-five per cent stannous chloride solutions 35g Sn Cl<sub>2</sub> 2H<sub>2</sub>O; 20 ml of hydrochloric acid (sp gr 1.2), and 80 ml of water. Add one piece of mossy tin to keep the solution reduced. Discard this solution after 3 months.

dropping bottle (about 60 ml size) of distilled water. Use enough water so that the liquid in the beaker is about 1/8 in. in height.

(5) Add in order three drops each of 50 pct sulfuric acid, 20 pct sodium thiocyanate (deep red color) and stannous chloride\* solutions. Mix by shaking. A rose red solution in the beaker indicates Vitallium; a colorless or only pale pink solution indicates Stellite No. 23. The rose color will last one or more minutes.

<sup>1</sup> Badger, F. S., Jr., and Kroft, F. C., Jr., *Metal Progress* 52, 394, 1947.

<sup>2</sup> Willard, H. H., and Diehl, H., "Advanced Quantitative Analysis," D. Van Nostrand Co., New York, 1943, p. 228.

formation of a definite rose color indicates Vitallium; conversely, the absence of a definite red color shows that the metal is not Vitallium.

In practice Stellite No. 23 contains less than 0.5 pct Mo, but a special batch of Stellite No. 23 modified to contain 4.5 pct W and 1.5 pct Mo gave a negative spot test. In this manner it was



# Quantometer Speeds Aluminum Alloy Analyses

By T. S. BLAIR

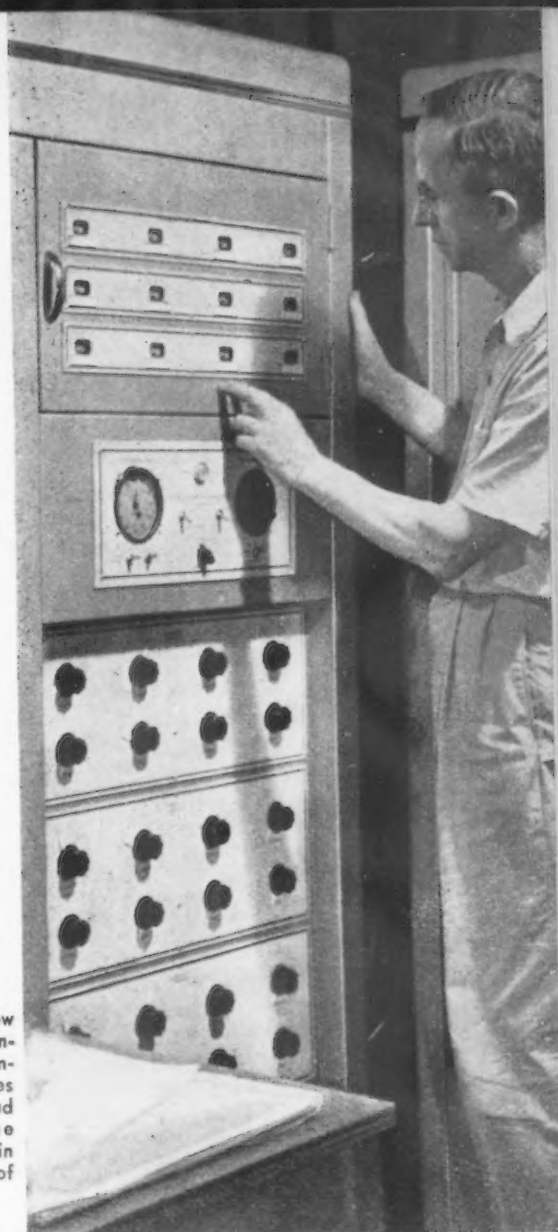
THE IRON AGE

SUBSTANTIAL operating savings, improved control of smelting processes and an important aid to research are expected to result from the installation of a Quantometer at The National Smelting Co., Cleveland, the first application of this instrument for quality control in the manufacture of aluminum casting alloys.

A Quantometer, in simplest terms, is a direct reading spectrometric analyzer and primarily enjoys speed and accuracy advantages over standard chemical and spectrographic methods.<sup>1</sup> While National has not yet put their instrument fully into production use, enough of the potentialities of the device have become obvious to assure the success of the installation.

The Quantometer is a special spectrometer, designed specifically by Applied Research Laboratories for the function of direct reading, as shown in fig. 1. It can determine quantitatively the composition of a prepared sample in about 45 sec. In general, the high sensitivity of the spectrometric method is maintained in the Quantometer except that in the extreme lower limit of measurement about three times the concentration of an element necessary to the best spectrographic methods is required. On

FIG. 1—Front view of recording console where the component percentages in the alloy are read directly from the small dials seen in the upper part of the cabinet.



the other hand, the accuracy obtainable with this instrument is superior to ordinary spec-

<sup>1</sup>See "The Economic Significance of Direct Reading Spectrochemical Analysis," THE IRON AGE, Aug. 14, 1947, p. 71.

trographic methods since the uncertainties of the photographic phase of the process have been replaced with an electrical integrating device of high precision.

The Quantometer installed at National has 20 receiving or counting stations of which a few will be tied up in duplications, for high and low concentrations, of the same element. Therefore up to 16 elements will be analyzable. These

**Application of the Quantometer, a special direct reading spectrometer, to the manufacture of aluminum casting alloys is described in this article. The rapidity—it is capable of 5-min analyses on a production basis—and productivity of the instrument will allow operating savings, better control in smelting procedures, and will facilitate research activity. The Quantometer is expected by the company to pay for itself in a relatively short time.**

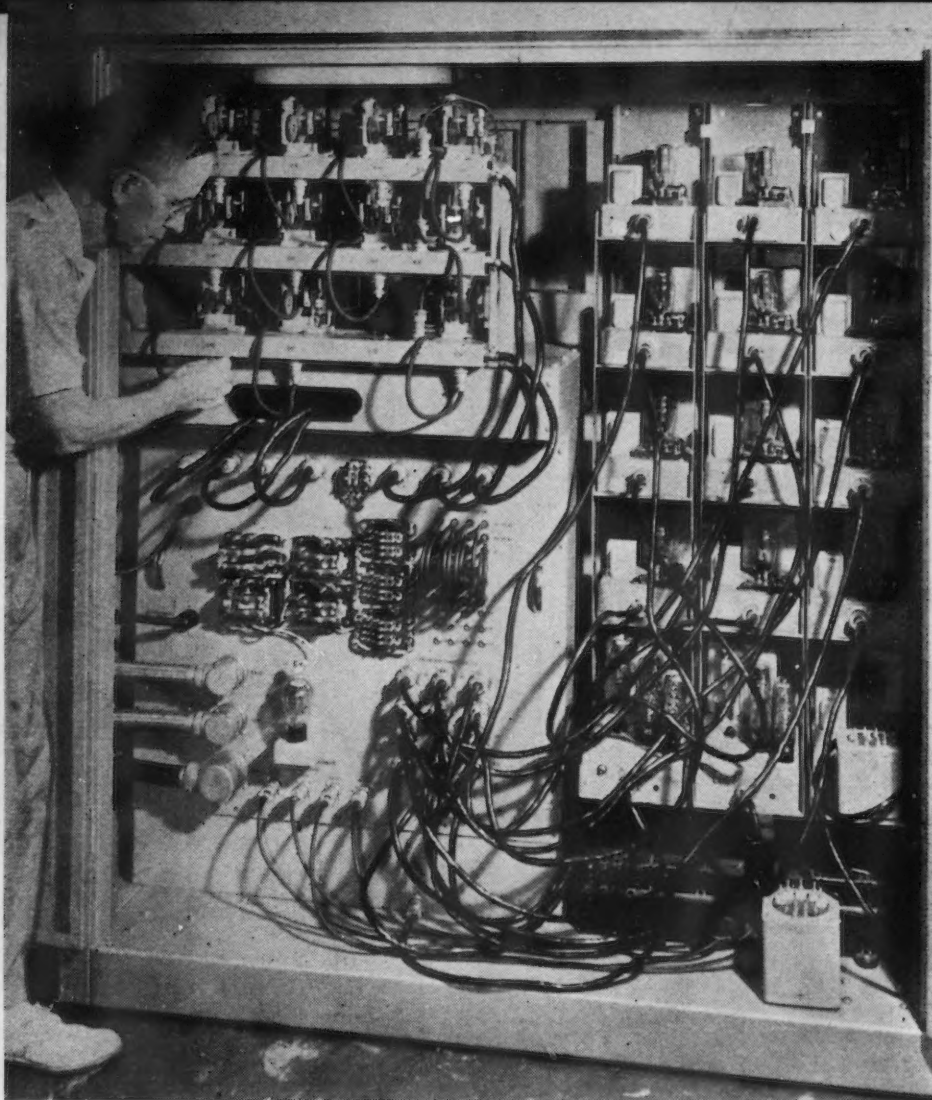


FIG. 2—Rear view of the recording console, with back panel removed, shows some of the individual electronic counting stations.

electronic counting circuits can be seen in fig. 2.

Current accuracy of the instrument is running about 3 pct of the amount of the element present. Interestingly, the analyses for zinc and

*Ed. Note: Purchase of the plant, laboratories and equipment of the National Smelting Co., of Cleveland, by the Apex Smelting Co., Chicago, was announced on November 14, 1947. Effective Jan. 2, 1948, the plant will equipment of The National Smelting Co., of Cleveland, Plant.*

other of the elements most difficult to establish by chemical methods are the easiest and most precise on the Quantometer.

The following figures, based on National's past experience, indicate the high cost of chemical analyses:

Element Analyzed	Time Required per Analysis in Lab Manhours	Cost of Analysis at \$3.00 per Lab Manhour
Copper .....	0.18	\$0.54
Nickel .....	1.3	0.60
Iron .....	0.2	3.00
Magnesium ..	1.0	3.90

These figures become doubly impressive when the volume of work handled is considered. In June 1947, a comparatively quiet month, chemical analyses for 7262 element determinations

were run. These required 5072 laboratory manhours, which is roughly 0.7 man-hr or \$2.10 per determination. This is a total wet laboratory expenditure of approximately \$15,000 for 1 month. In addition, the cost of the spectrographic determinations of 21,900 elements made during the same month must be added. The necessity of using chemical methods results from the difficulty of accurately measuring element concentrations in excess of 1 pct by spectrograph.

Used in production the Quantometer will readily analyze 12 samples with an average of 12 elements per sample in an hour. This is 144 element analyses per hr or 103,680 analyses per month. Thus, at this plant the Quantometer alone will be able to handle roughly three times the normal past capacity of the combined chemical and spectrographic laboratories.

The ramifications of this trebled laboratory capacity, with the analytic results being turned out practically instantaneously, pervade every phase of the company's operations. More exact determination of the composition of all the raw materials to be used in building an alloy, composition control of melts all along the line and extremely important applications in research programs will be possible.

Production foremen, in order to make an aluminum alloy properly, must be sure of the composition of addition components, especially scrap materials in which uniformity of composition is not guaranteed. Additional laboratory capacity and the relative cheapness of analyses will permit more accurate knowledge of raw material composition, which in turn will be reflected in faster, cheaper production and in better composition control of the final alloy. In past practice, furnaces were held and the metal kept molten until analysis showed that the desired specifications had been attained. When the composition of addition materials was uncertain, it was an easy matter to miss target specifications on the alloy which, of course, involved further additions and even longer periods of furnace holding.

Standard practice at National has been to build critical alloys by partially charging a furnace, melting the material and analyzing control samples before making further additions. Thus it has been necessary to hold the furnace as long as 2½ hr, at an expense estimated to be in the neighborhood of \$50 per furnace hr, until the control sample analysis informs the metallurgist of the further additions to be used. This process of sampling and holding continues along the line to the extent that an average of



four control samples has been required on the company's melts. It is here that the speed of the Quantometer makes itself felt. Instead of 2½ hr, a furnace foreman will need only wait from 5 to 10 min for his analysis. In this connection, a system of pneumatic tubes for sending samples to the Quantometer and a Telautograph instant written message communication system for returning analytic results save considerable time in the overall operation.

The Quantometer itself is easily capable of 5-min analyses on a routine production basis. The sample, a 5/16-in. diam sand cast rod, is faced on a lathe, a 1-min operation, is mounted in the machine and gets a 25 to 30-sec spark excitation, after which approximately 30 sec are required for complete readings to be taken. The excitation source unit is shown in fig. 3. Another ½ min is required for sending the data back to the furnace foreman, and it has only taken about 5 min for what was previously a 2½-hr procedure. In cutting down the time required per melt, each furnace is afforded an increased capacity.

The company expects, on the basis of these considerations, that the new installation will well pay for itself. The investment was around \$70,000 for the instrument, an air-conditioned room and the transmission systems. In addition there are the presently intangible advantages which are expected to result from the use of the instrument as a research tool.

The benefits of the Quantometer in research, as in production, spring primarily from its rapidity and productivity. For one thing, it will enable determinations of the composition of segregation areas of castings. An ingot or casting can be sliced up and a multitude of

samples, from the outside in, run to determine the composition gradient, which the particular casting alloy evidences or which the particular casting procedure produces. Or, an ingot or casting can be sliced, face machined, and hard spots or irregularities investigated as a check on production.

A great deal of further research on the effects of minor alloying elements in aluminum casting alloys is needed, the company believes, and will now be pursued there on a scale hitherto economically impossible. In recent years the whole theory of aluminum casting alloys has changed as research has proved that control and balance in the minor alloying elements or impurities<sup>2</sup> can have a remarkable effect on physical properties, such as castability and ductility, of aluminum alloys. For instance, when manganese is controlled very closely and tuned to the iron

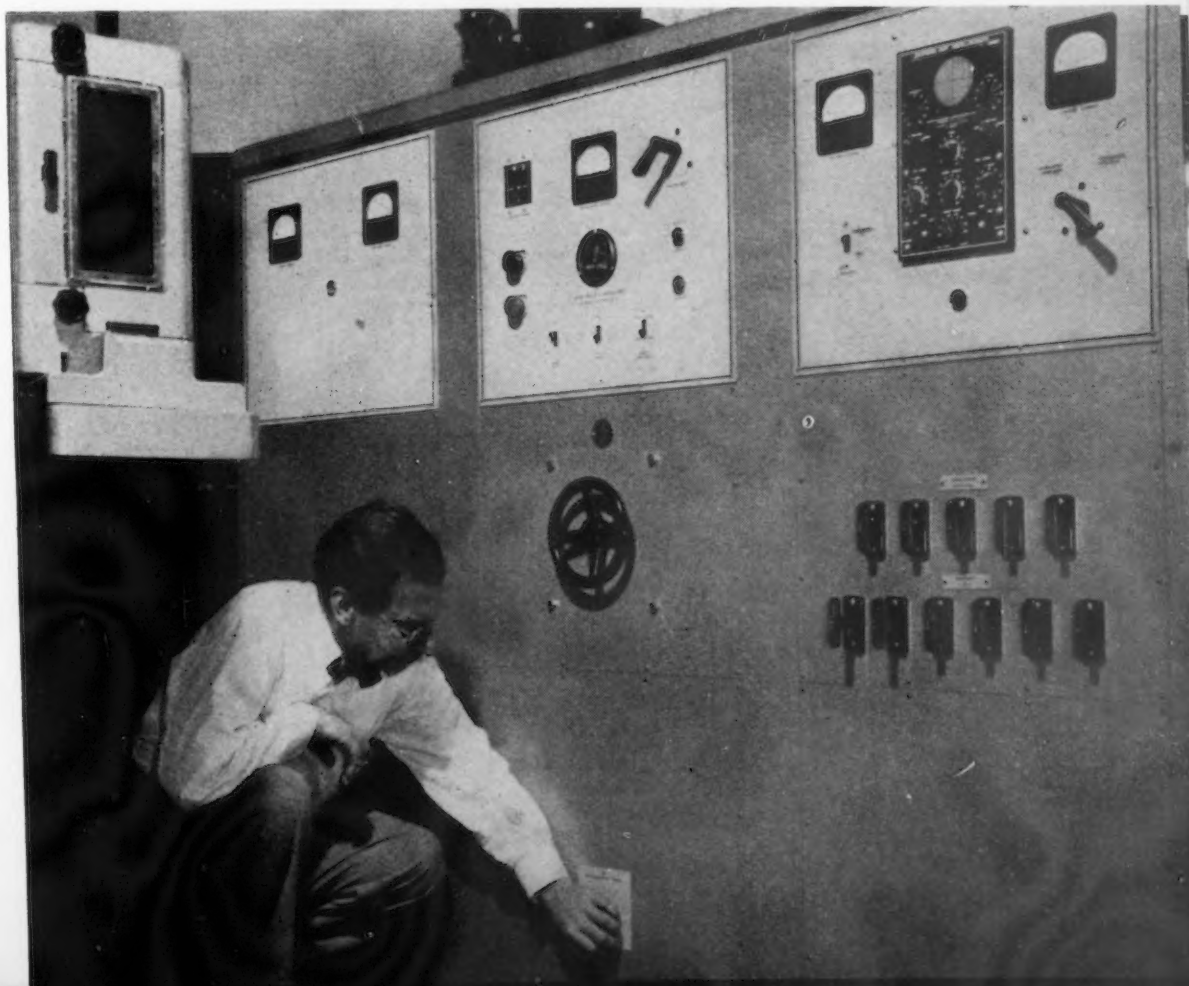
<sup>2</sup> See "Discussion of the Effect of Minor Alloying Elements on Aluminum Casting Alloys," *ASTM Bulletin*, August 1942.

content, a very beneficial effect is evidenced. Alloys may require this close harmony in five or six elements before advantages become considerable, and specifications have become increasingly stringent as research has developed and thereby narrowed the optimum proportions of these minor elements. According to National, the close control involved in producing such alloys will become possible on a practical production basis with the use of the Quantometer. The use of the instrument, in production and research, should accelerate this trend toward better specifications and casting alloys.

Another research application will be the determination of rates of solubility during the

(CONTINUED ON PAGE 135)

FIG. 3—At upper left is the arc-spark stand of the spectrometer. The large cabinet houses the source excitation unit.



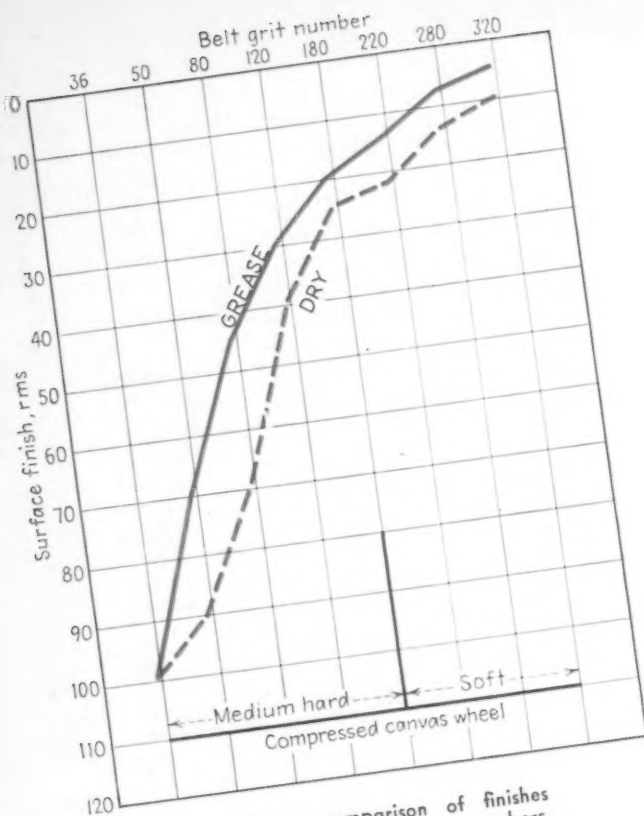


FIG. 1—Surface comparison of finishes using belts of the same grit numbers, greased and ungreaed. This comparison was made with a Profilometer and Brush Analyzer on low carbon steel.

USE of abrasive belts with backstand idlers in precision finishing operations has reduced finishing time and improved finish quality in many applications. Increased attention has recently been focused on the effects obtained with the application of a lubricant to fine-grit abrasive belts to further improve finish quality. The Behr-Manning Div. of Norton Co., Troy, N. Y., with the cooperation of equipment manufacturers, has been investigating the effects of lubricants when applied to abrasive

## Fine-Grit

By A. D. STOUT, JR.  
THE IRON AGE

belts. An effort has been made to work out specific finishing problems and equipment designs for industry, and to recommend changes in manufacturing practice, when necessary, to obtain full advantage of belt finishing.

Typical of the work done here is an improved finishing method developed for a manufacturer of formed parts which are chrome plated. The practice was to form the parts from steel sheet, after which a number of grinding and finishing operations were necessary to obtain the desired finish prior to plating on all contours. By converting existing finishing and polishing equipment, it was found possible to finish the sheet stock with lubricated coated abrasive belts prior to forming with the result that finishing time was considerably reduced with handling before plating eliminated, and a more uniform finish was produced. In this particular instance, the surface finish required should measure under 5 micro-inches, a finish which can be obtained by using a well greased 320 grit belt.

Another case involved a manufacturer of carpenters' bits. Here, because of the irregularity of the surface which must be finished, the manufacturer has employed an indexing table with a

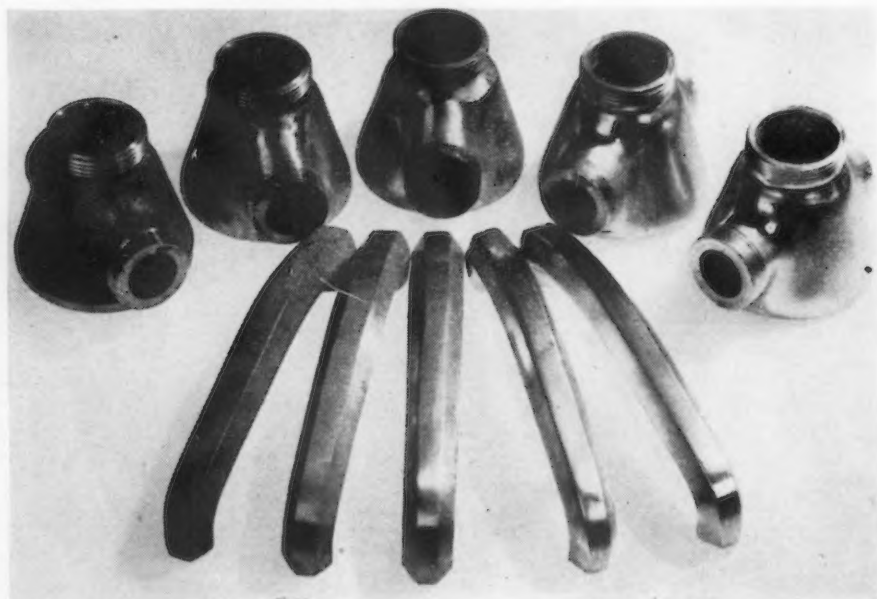


FIG. 2—Finishing of these plumbing fixtures formerly required the four steps shown here. Operations have been reduced to three with belt finishing equipment and lubricants.



# Lubricated Belt Finishing

number of set-up wheels used at various angles. To obtain a finish of maximum uniformity, it is proposed to finish these pieces with abrasive belts installed on a conventional automatic rotary-type grinder designed for abrasive belts, and using soft, contour-fitting buffs as back-up wheels. Where large scale finishing operations have required batteries of grinders, a reduction in the number of machines required has been effected in many cases by converting to coated abrasive belts.

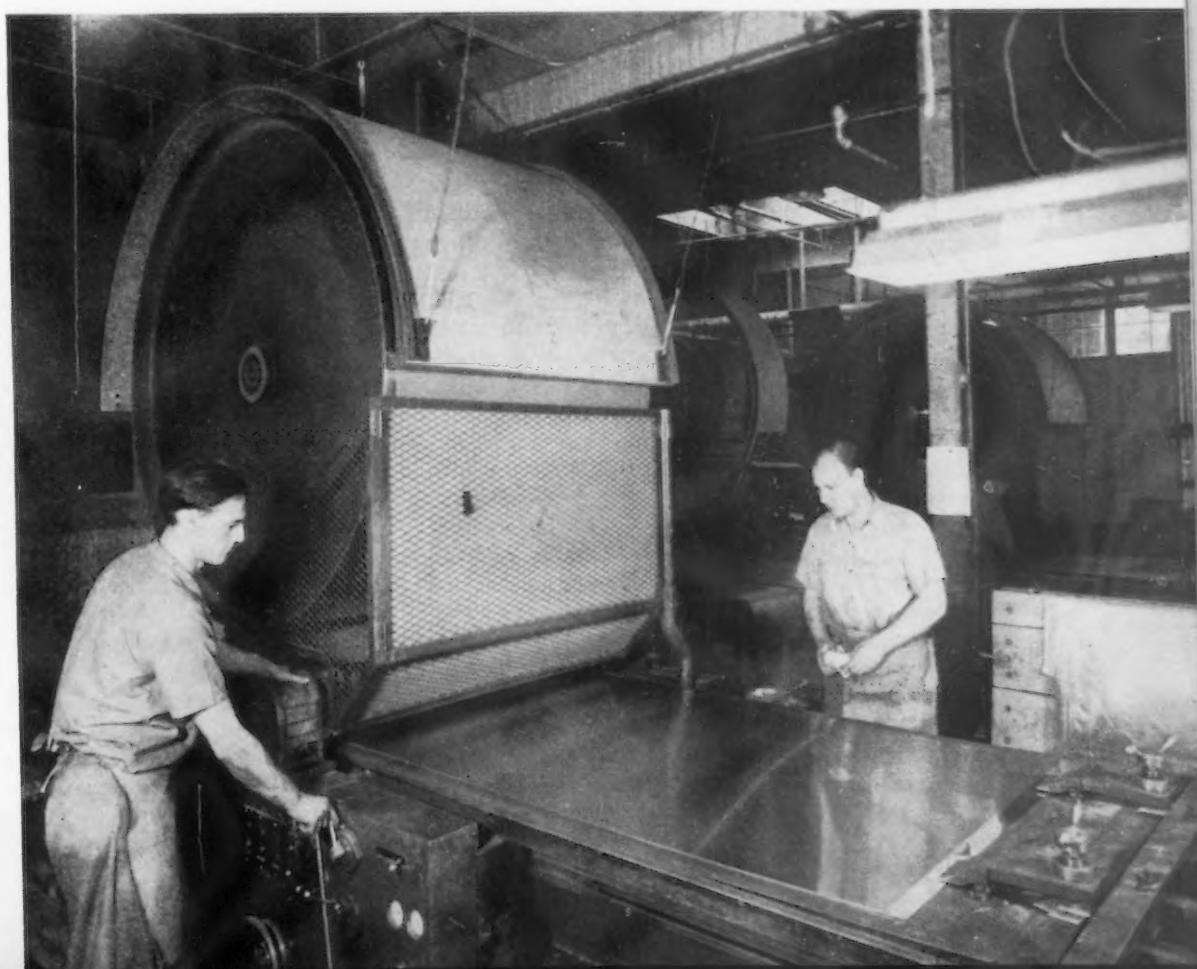
Grease or lubricants, when applied to belts, have been found to provide a finer finish, approaching a buffed surface, and also to increase belt life. In many cases the number of belt grits required from initial grinding to the final finishing operation are reduced. It is emphasized that although under certain circumstances a finish approaching buffing may be obtained, polishing with greased abrasive belts does not eliminate buffing.

Lubricants for belts, as for set-up wheels, range from kerosene to heavy grease in stick form having a low melting point. These materials are used to lubricate the abrasive coating, prolong the cutting life and, in the case of grease particularly, to control the depth of cut. By filling the coating with grease, a better finish and

**Coated abrasive belts with backstand idlers and contact wheels have been found suited for many types of production finishing operations involving metals and plastics. Increased attention has recently been given to the effects produced by lubricants when applied to coated abrasive belts, particularly belts of the finer grit numbers. Some typical production operations, in which product finished has been improved and the number of operations reduced are described in this article. Special equipment developed for polishing zinc and stainless sheets is also discussed.**

higher luster may be obtained. The reason for this is that the grease loads the abrasive surface and acts as a cushion, permitting only the tops of the grains to contact the work. A comparison, given in fig. 1, of finishes using belts of the same grit numbers, greased and ungreaed, illustrates this point. From this graph may be seen that a No. 180 grit belt used with grease gives

FIG. 3—Three 18 x 10 zinc sheets may be polished simultaneously on this machine designed for greased belt finishing. Plates were formerly cut to size first and hand-polished with pumice stone.



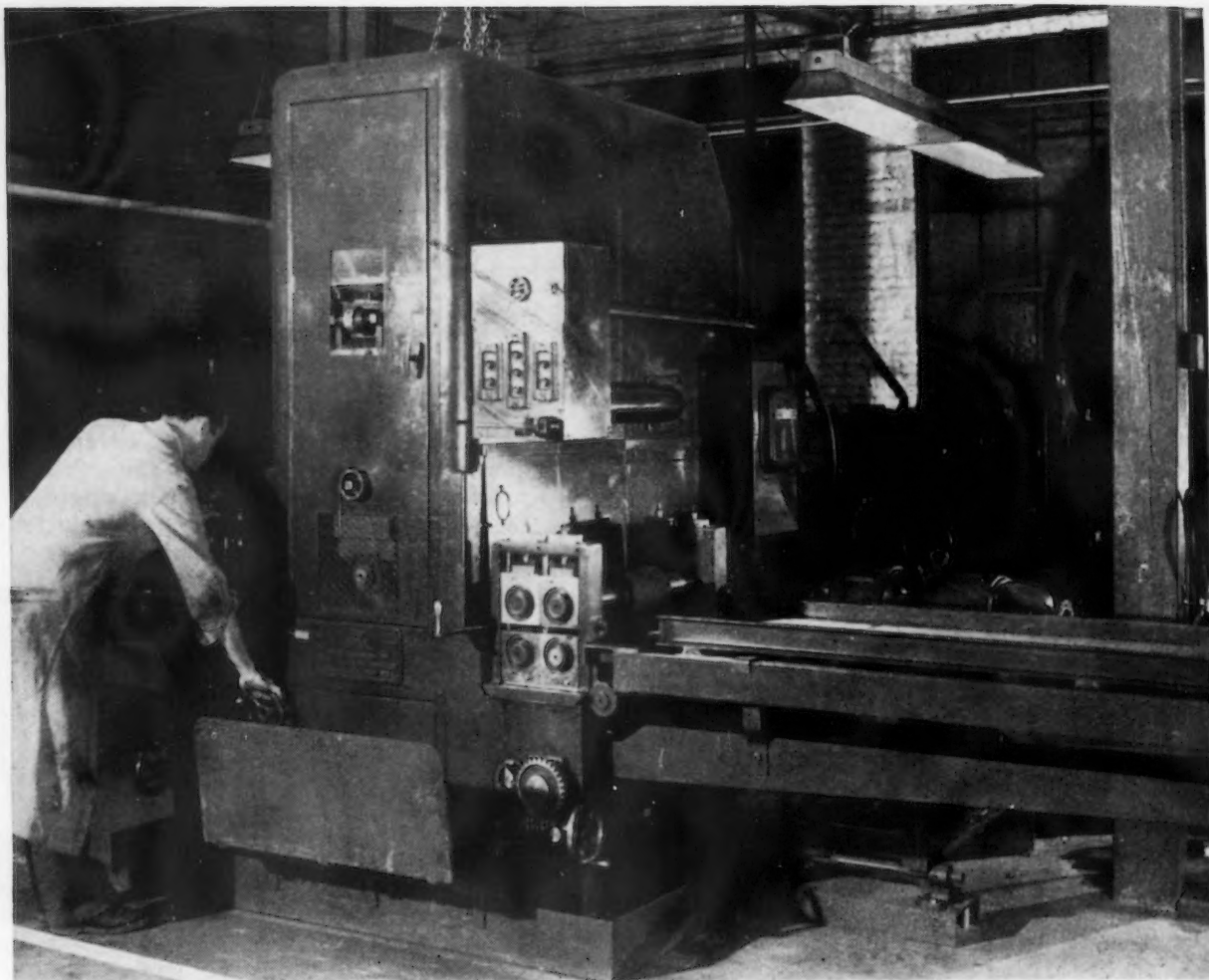


FIG. 4—Machine developed for stainless sheet three-step polishing, using coated abrasive belts.

a smoother finish than a No. 220 belt without grease.

The preparation of brass castings for plating in the plant of a manufacturer of plumbing fixtures had required four operations, including buffing. Two types of castings produced may be seen in fig. 2 which indicates the progression of operations, from the rough casting through the final buffing. Installation of abrasive belts has eliminated an operation formerly calling for a No. 120 grit and better results are obtained with a No. 80 grit belt followed by a No. 180 grit belt lubricated with tallow, then buffing. In addition to eliminating one operation and obtaining a more uniform finish of better quality, considerably less buffing is required. This company estimated that production has increased one third and rejects have been substantially reduced. The company also reports that inexperienced operators can more easily be trained to turn out good work at a reasonable rate of production. As a result, a number of backstand idlers are now operated with a large variety of contact wheels of various densities selected for their particular requirements.

An instance in the plastics industry where finishing time was considerably reduced has been reported by a manufacturer of Tenite gunstocks. This company had previously used a No. 100 and No. 180 belt for roughing and a worn No. 320

grit belt for finishing. All were used without lubricants. In addition, four operations of various kinds were required to bring up an acceptable surface. Experiments with coated abrasive belts proved that the grinding could be done with a No. 100-X grit cloth greased and No. 180-X grit cloth also greased with the work held against a contact wheel. All that was necessary to bring the surface up to a finish equal or better than the original method was buffing. Thus, four of seven steps were eliminated.

The experience of a manufacturer of polished zinc plates for photoengraving offers an example of the development of a more efficient method of polishing as well as the improved finish which was achieved with greased belts. Formerly, the original zinc sheets were cut to comparatively small pieces and individually polished with pumice stone, a slow and dirty operation. After considerable experimentation with greased, coated abrasive belts, several machines such as shown in fig. 3 were installed. These were designed to polish three full size sheets simultaneously, each measuring up to 18x10 ft. This work is being done on these machines with a No. 320 grit coated abrasive paper belt with palm oil and, whereas the original method resulted in a surface of from 9 to 14 microinches, the new method consistently produces sheets with a better and more uniform surface mea-



suring from  $3\frac{1}{2}$  to  $4\frac{1}{2}$  microinches. Aside from this, all pumice polishing has been eliminated and working conditions improved due to lack of dust. This method can be applied equally as well to other material in sheet form where a fine finish is desired.

The machine illustrated in fig. 4, which employs lubricated abrasive belts, has been designed for steel mills and fabricator use in polishing stainless steel sheets. The machine incorporates several interesting design features. It has a variable speed traversing bed which grinds or polishes in both directions. An air cylinder actuated billy roll provides pressure between the sheet and abrasive belt with valves and gages to control the pressure. A hydraulic drive with opposing cylinders propels the table in both directions and provides smooth action, quick reversal, and also eliminates the possibility of chatter marks. This machine is designed for abrasive belts 10 ft 6 in. long which operate over only two rolls to facilitate abrasive belt

changing. The lower or contact roll is steel-cored with a synthetic covering of a density to suit the specific operation. An average of three steps is required to obtain a No. 4 standard finish, and time required for polishing is dependent on the quality of the sheet.

In any polishing operation the grit numbers required to obtain a given finish depend on the type and quality of material. In stainless steel sheet finishing to obtain a No. 4 finish with greased abrasive belts, the grit numbers may range from No. 36 to 180. A good average range of grit numbers is 50, 80 and 120, or, 60, 100 and 150. In the three-step polishing process, machine oil and kerosene are used with the coarsest belt, mainly to prevent the belt from loading, reduce frictional heat and increase cutting speed. With the intermediate belt, palm oil or a substitute is customarily used to prevent belts from loading and to provide a degree of luster. For final finishing in all cases, a heavier grease is used to produce the final polish.

## A Simple Method of Forming Sheet Metal

THE forming and drawing of sheet steel into various designs, a tedious and expensive task, can be done easily and quickly if a hand-operated air hammer, a press, and wooden molds are used, as shown in the accompanying illustration.

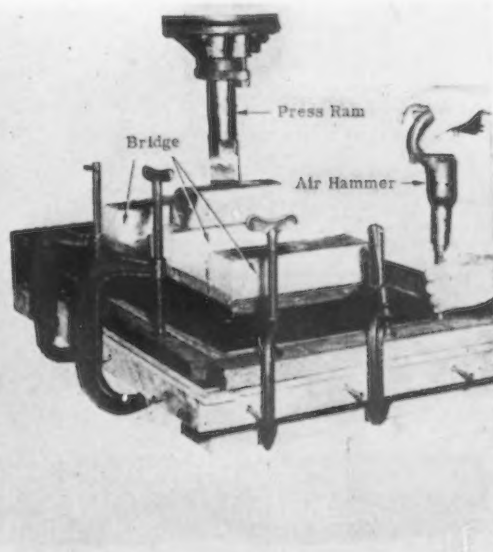
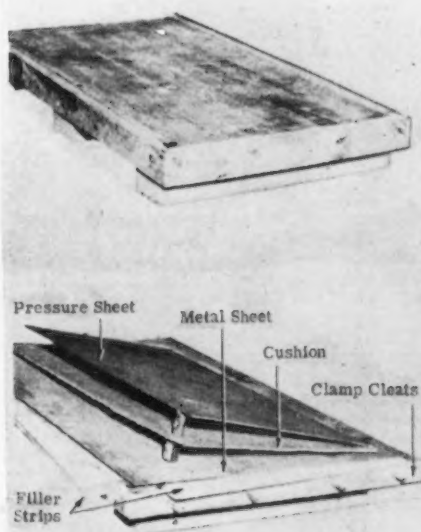
In a method developed at General Electric Co., Erie, Pa., a mold is made in the pattern shop to the exact size of the product required. Sheet metal, cut to the proper size, is placed over the wooden mold. A cardboard cushion is placed on the center area of the metal sheet, and in turn, a steel plate is put on top of this cushion. The steel plate serves to distribute the pressure used to force the sheet metal into the molds. The

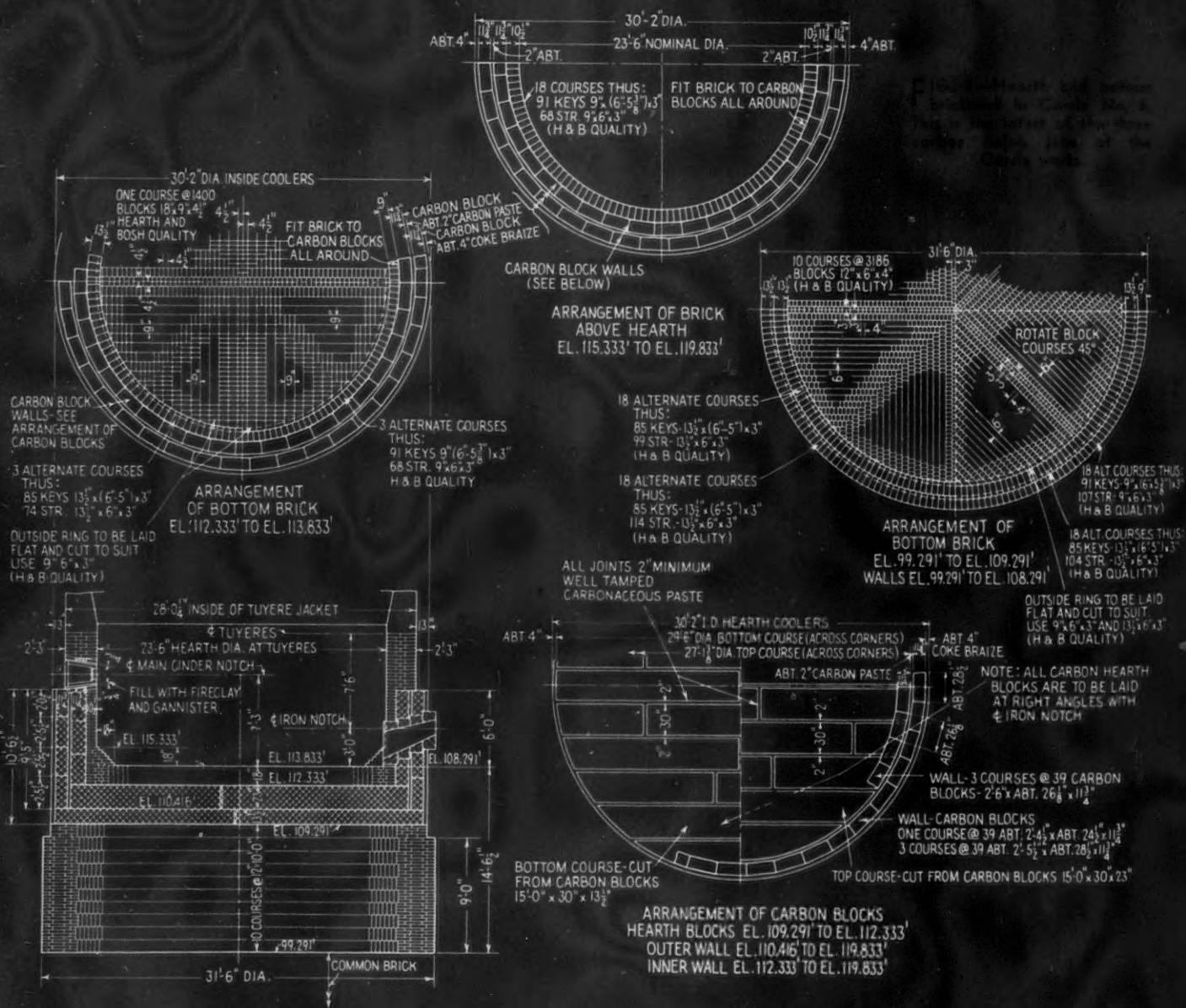
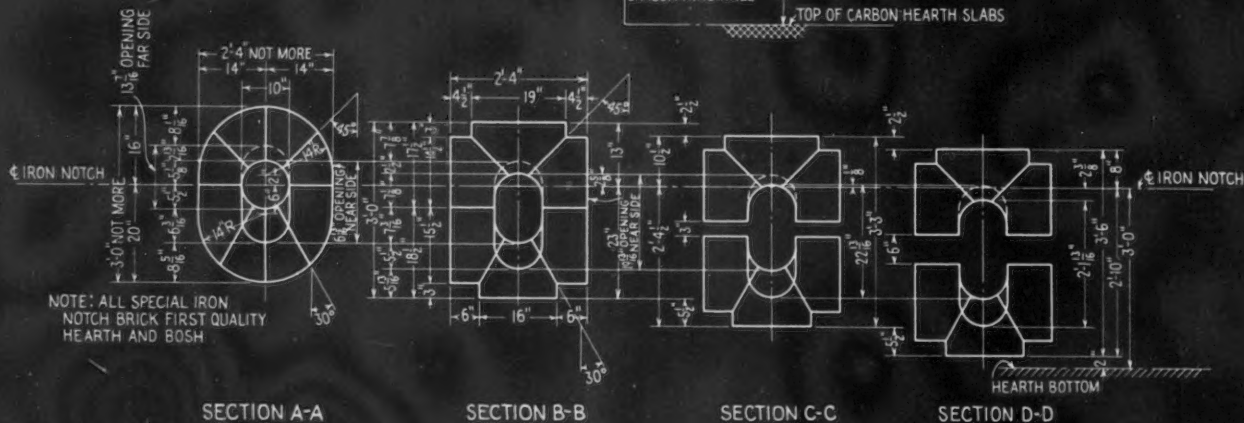
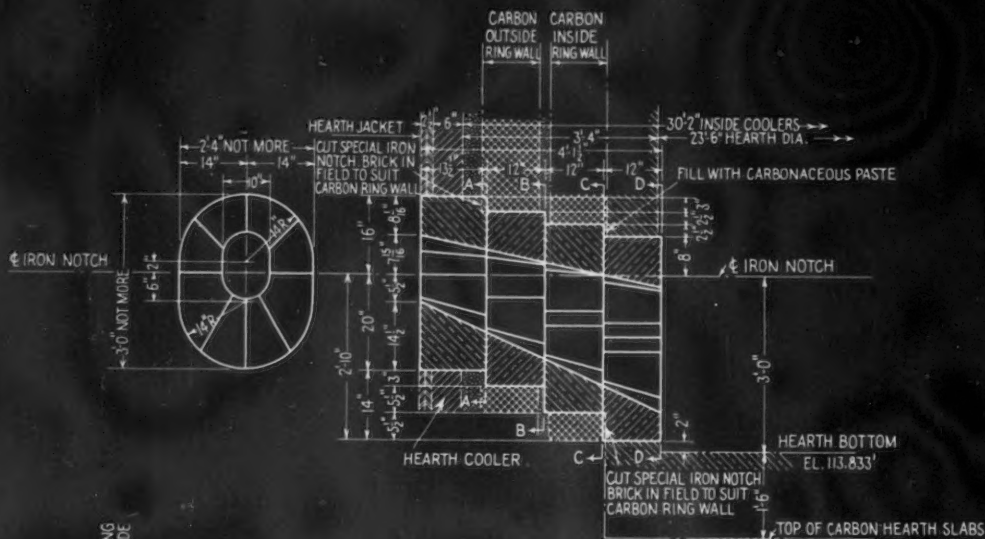
pressure is applied by placing a bridge on the steel plate and putting the entire unit under the ram of an air-operated press.

An air hammer, equipped with a suitably designed head, and striking 6000 blows per min, beats the sheet metal into various convolutions of the mold. Rounded corners and curved surfaces are easily formed without leaving uneven areas in the metal or cutting or cracking the metal.

Edges of the metal sheet should be clamped to the outside edges of the mold and as metal is required to fill areas in the mold, it is drawn through the clamping device.

THE assembly details of the mold arrangement are shown at left, while at right the press ram and clamps are positioned.







# Carbon Hearths for Blast Furnaces

**Construction details of five carbon block blast furnace hearths, together with some notes on operating experience with carbon linings, are given in this article. Covering two new South Works furnaces and three Carrie furnaces, of Carnegie-Illinois Steel Corp., the discussion also described a new design of iron notch used in the Carrie units.**

## Carbon Hearths at the Carrie Furnaces

AT the present time, three partial carbon hearth installations have been installed in blast furnaces at the Carrie furnace plant of the Homestead District Works, Carnegie-Illinois Steel Corp.\* All three of these furnaces have been in operation for some time. The three furnaces are:

No. 1 Furnace—Hearth diameter of 23 ft and rated at 931 tons per day. Blown in during December, 1945, and has produced 431,879 tons to Sept. 1, 1947.

No. 7 Furnace—Hearth diameter of 23 ft 6 in. and rated at 971 tons per day. Blown in during July, 1946, and has produced 375,444 tons to Sept. 1, 1947.

No. 6 Furnace—Hearth diameter of 23 ft 6 in. and rated at 971 tons per day. Blown in during November, 1946, and has produced 264,450 tons to Sept. 1, 1947.

The details of the hearth and tapping hole construction and operating experience on these installations are as follows:

The hearth construction of No. 1 furnace is as follows: Starting from 12 ft below the hearth elevation, there are seven courses of hearth and bosh quality blocks, then two courses of carbon blocks, and finally three courses of hearth and bosh blocks. All blocks

\* This discussion of the carbon hearths at the Carrie Furnace Works is an abstract of a paper entitled "Review of Design of Carbon Hearth Installations and the Results Obtained at the Carrie Furnaces," by C. J. Fleisch, superintendent, Carrie Furnaces, Carnegie-Illinois Steel Corp., presented at a recent meeting of the Blast Furnace & Coke Oven Assn. at Cleveland.—Ed.

are laid on end and each course rotated 45°. The hearth and bosh blocks are 12x6x4 in., and the carbon blocks 12x8x4 in. The top of the hearth carbon blocks is 6 ft below the center of the iron notch. An 18-in. ring wall of 18x11x4-in. straight and key carbon blocks is laid against the hearth coolers. This carbon ring

wall starts at the bottom of the hearth carbon blocks and is carried up to the top of the hearth cooling jacket, a distance of 11 ft 3 in.

The construction of No. 7 furnace is similar to No. 1, except in the size of the carbon blocks and final courses of hearth and bosh blocks. Starting from 15 ft below the hearth elevation, there are 10 courses of 12x6x4-in. hearth and bosh quality blocks, then two courses of 12x12x8-in. carbon blocks, and finally two courses of 18x9x4½-in. hearth and bosh blocks. All blocks are laid on end and each course rotated 45°. Again, the top of the hearth carbon blocks is 6 ft below the center of the iron notch. As in No. 1 furnace the 18-in. ring wall of 18x11x4-in. carbon blocks is laid against the hearth coolers from the bottom of the hearth carbon blocks to the top of the hearth cooler, a distance of 11 ft.

In No. 6 furnace (see fig. 1), starting 14 ft 6½ in. below the top hearth elevation, there are 10 courses of 12x6x4-in. hearth and bosh quality blocks, laid on end and each course rotated 45° as in the other furnaces. Then two courses of large carbon blocks. The bottom course is cut from carbon blocks 15 ft x 30 in. x 13½ in. The top course is cut from carbon blocks 15 ft x 30 in. x 23 in. All blocks are laid at right angles to the center line of the iron notch. All joints are a 2-in. min and tamped with carbonaceous paste. Finally, there is one course of 18x9x4½-in. hearth and bosh blocks. Against the hearth coolers from the large hearth blocks to the top of the hearth coolers are two rings of carbon block, one inside the other. These blocks are about 30x28½x11¾ in., and form a carbon ring wall about 2 ft thick.

In addition to the use of carbon in the construction of the hearth, both No. 6 and No. 7 furnaces were equipped with a one-piece solid carbon cinder notch liner to guard the under part of the opening, carbon being resistant to

slag erosion and not subject to slag or gas corrosion. For these same reasons all three furnaces were protected by a ring of carbon brick around the cinder notch and around all tuyere openings.

#### Tapping Hole Design

The tapping holes on these three furnaces are constructed of special shaped fireclay brick. In an attempt to improve the tapping holes a new design was tried. The design of the notch brick used in No. 6 furnace is shown in fig. 2.

It is believed that there are several advantages to this new type tapping hole. The first is the simplification of its construction and the increase in strength obtained by the use of large brick shapes rather than the ordinary sized bricks. While the old style tapping hole allowed a very small variation in the angle of drill, this one allows a comparatively large amount.

It has been the experience at the Carrie works that the size of casts on furnaces with carbon hearths has been more uniform, and this has been particularly true of No. 6 and No. 7 furnaces; also that the iron analysis takes more abrupt swings from cast to cast. This latter result, it is felt, is due to the lack of the cushioning effect of the large pool of iron in fireclay block hearths. It has also been noticed that if a carbon hearth furnace gets cold in the hearth for several casts, it takes more coke to restore the proper hearth temperature.

While thermocouples were not installed in any of the three installations, it is indicated by the hearth cooler discharge water temperatures that the loss of hearth heat to the cooling water has been higher, with the highest

temperature being on No. 6 furnace where the large carbon blocks were used, this temperature running 5° to 6°F higher than those on fireclay installations.

There has been no change in flushing or tapping practice at the Carrie works between carbon and fireclay installations, these practices being the same on all furnaces. Some trouble has been experienced on No. 1 furnace with iron in the slag; however, this furnace has a tuyere directly over the cinder notch which could contribute to this trouble. No. 6 and No. 7 furnaces are normal in this respect. No conclusive iron temperatures have been taken; however, a few temperatures taken with an optical pyrometer showed no difference from those taken on furnaces with fireclay block hearths.

Another item of interest is the experience coming in off of bank following a recent shutdown. Five furnaces were banked for approximately 8 days. The two furnaces with fireclay block hearths, No. 3 and No. 4, gave more trouble and took a longer period to make iron which was acceptable to the openhearth. No. 4 furnace sent iron on the eighth cast and No. 3 on the ninth cast, while in comparison the carbon hearths No. 1—third cast, No. 6—fourth cast and No. 7—second cast. While this may not be a fair comparison due to the life of the No. 3 and No. 4 furnaces, it is interesting to note. Also the fireclay block hearths skulled up on the hearth walls to a greater extent, causing trouble in getting a proper flush from the monkeys. It took approximately twice as long to get a satisfactory flush from the fireclay block hearth furnaces as it did on the carbon hearths.

## Carbon Hearths in New South Works Furnaces

**T**WO 1500-ton blast furnaces under construction at the South Works of Carnegie-Illinois Steel Corp. incorporate in their design hearths constructed of carbon blocks. Hearth diameter of these identical furnaces is 28 ft, and approximately 579,000 lb of carbonaceous material is going into the construction of each hearth. This total includes the carbon blocks themselves and the ramming mix, carbon cement and coke breeze used in setting the blocks and filling voids. A third blast furnace having a similar hearth has been rebuilt and enlarged at the Gary Works of Carnegie-Illinois. Lines and dimensions of all three furnaces are identical. Fig. 3 shows a lined section of one of the South Works' furnaces.

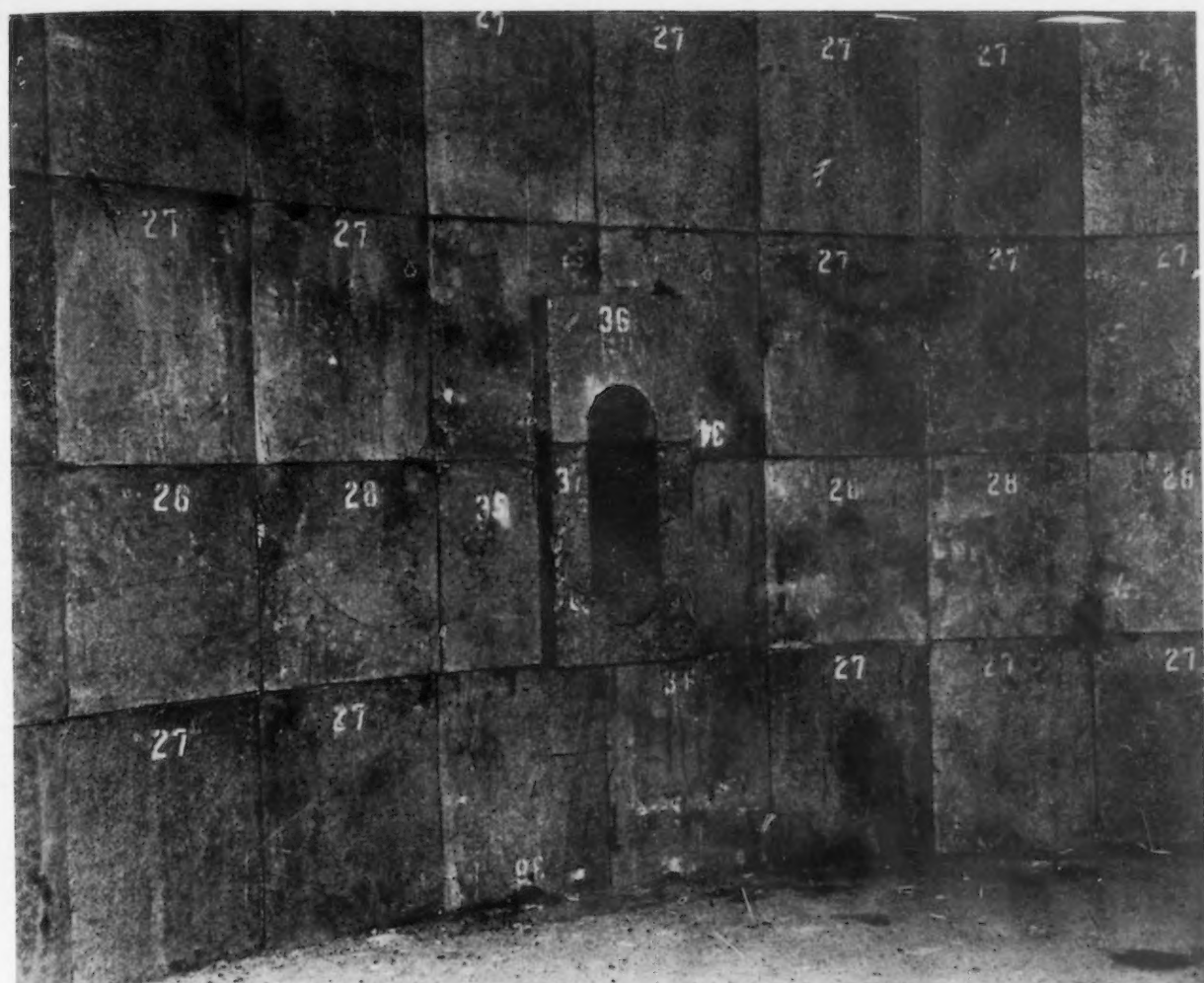
Carbon blocks are employed in blast furnace hearths to attain greater strength, prevent the formation of large salamanders, and minimize the possibilities of hearth breakouts. Carbon blocks are impervious to slag and iron, have a low thermal expansion, and are not adversely affected by any temperatures attained in blast furnace operations.

The carbon blocks, in two layers, forming the bottoms of the new hearths, are each 22½

in. thick and 30 in. wide and have a maximum length of 15 ft. They are laid at right angles to the center line of the iron notch, with a 2-in. joint between adjacent blocks. Vertical joints are staggered (see fig. 4), and all joints are filled with carbon ramming mix. Wide joints are used because the blocks expand on heating, while the ramming mix contracts to a certain degree and then expands upon further heating so that a tight bottom is maintained at all times. Each hearth block is machined top and bottom.

Sidewall of the hearth is built of carbon blocks in a double wall extending to a point 3 in. above the top of the hearth jacket. This corresponds to a level 4 ft 4 in. above the center line of the iron notch, the center line of the notch being 5 ft from the top course of the carbon blocks forming the bottom. The inner sidewall is built of blocks 15 in. thick; the outer wall is 11¾ in. thick. A minimum of 2 in. of carbon ramming mix is tamped between the two wall courses. Joints between the individual sidewall blocks are a maximum of 1/16 in. in width, filled with carbonaceous cement. The inner wall consists of four courses of block built up from the top course of bottom





**FIG. 3**—A section, including the iron notch, of the carbon lining in one of the new blast furnaces at the South Works of Carnegie-Illinois Steel Corp.

• • •

**FIG. 4**—Positioning a carbon block in one of the new South Works' furnaces. The wooden wedges maintain spacing until the ramming mix is in place.

• • •



block while the outer wall consists of five courses and rests on the outer edge of the lower course of bottom block that extend past the top course. Each course of wall block consists of 44 pieces. A total of 453 blocks, each averaging 600 lb in weight, enters into each complete hearth. A minimum thickness of 3¼ in. of tarred coke breeze is tamped into the space between the hearth jacket and the outer carbon block sidewall.

A pad of fireclay bottom blocks 1 ft 6 in. thick and a 9-in. firebrick sidewall inside the carbon lining protect the entire surface of the carbon hearth during blowing in until it has been heated to operating temperature. The blocks and firebrick are intended to last only a relatively short time, until they have served their protective purpose.

Underneath the two courses of carbon blocks forming the hearth bottom are seven 1 ft 6 in.

courses of fireclay bottom blocks, and a 2 ft 3 in. pad of second quality firebrick, built up from the concrete foundation of the furnace. The concrete beneath the refractories of the hearth is 10 ft 6 in. thick. The total thickness of the concrete foundation, which has a 58-ft diam, is 20 ft 2 in. under the column base-plates. The cooling staves, 16 ft in height and 6 in. thick, also referred to as the hearth cooling jacket, surround the hearth. The 2-in. space between the staves and the all-welded, steel-plate shell of the hearth is tamped with a cement grout.

Bottom construction of these furnaces is of the open type, with the steel plates forming the hearth shell exposed. The volume enclosed by the completed hearth structure is slightly in excess of 5700 cu ft, including the volume of the firebrick pad and sidewall that protect the carbon hearth during blowing in.

## Russian Methods For SPOT TESTING STEEL

**S**POT testing methods utilized by Russian chemists—for chromium, molybdenum, aluminum, nickel, tungsten, and vanadium—are outlined herein in tabular form. It will be noted

*The data in the accompanying table were compiled by Walter E. Thrun, Valparaiso University, from L. M. Kul'berg, Zavodskaya Lab. 12,133-9 (1946); Chem. Abstr. 40,5663 (1946); G. S. Smith, Iron & Steel, June, p. 319 (1947).*

that most of these tests are so arranged that residual quantities of alloying metal do not give positive tests. In general, the filter paper, which in some cases is prepared with reagents, is dipped into the solution or suspension prepared on the metal until it has soaked up solution for a distance of about 3 mm. A drop of the final reagent is then added about 3 mm away. A narrow colored zone will appear when the solutions meet.

Alloying Element	Preparation of Solution on Steel	Test Paper	Reagent to Spread Over Filtered Zone	Color at Contact
Cr	1 dr conc HNO <sub>3</sub> , 1-2 min; add excess Na <sub>2</sub> O <sub>2</sub> ; stir and add water to make paste.	Tumeric paper	1 dr 0.1 pct benzidine in 30 pct acetic acid and 5 pct Na acetate	Blue, 1 pct or more. No additional color 0.5 pct or less. 0.3 pct green after long time
Mo	Same as for Cr	Ordinary filter paper	1 dr, 12 hr old solution; 1 vol 10 pct SnCl <sub>2</sub> in conc HCl + 1 vol 20 pct NH <sub>4</sub> CNS	Red proportional to pct Mo
Al	Same as for Cr	Ordinary filter paper	1 dr 0.3 pct ammonium salt of auritricarboxylic acid	Red band does not disappear after successive exposure to NH <sub>3</sub> and Br <sub>2</sub> vapor
Ni	1 dr conc HNO <sub>3</sub> , 1-2 min; 3-5 dr sat Na pyrophosphate and NaK tartrate; stir	Filter paper soaked 1 pct malachite green, dried and soaked in 1 pct alcoholic dimethylglyoxime	Hold over NH <sub>3</sub> 30-40 sec; hold over Br <sub>2</sub> 30-40 sec; add 1 dr 10 pct NH <sub>3</sub>	Yellow when 0.5 pct or less; rose 0.5 pct to 1 pct; red when more than 1 pct.
W	1 dr 1 vol 30 pct H <sub>2</sub> SO <sub>4</sub> + 1 vol conc HNO <sub>3</sub> , 2-3 min; add large excess Na <sub>2</sub> O <sub>2</sub> ; stir; add excess 10 pct NH <sub>3</sub> ; mix	Dip folded filter paper tip in mixture	On top of precipitate add 2-3 dr fresh 1 pct benzidine in glacial acetic acid	Orange-red brown spreads out; 1 dr 3 pct H <sub>2</sub> O <sub>2</sub> does not completely destroy 5 pct W
Va	1 dr conc HNO <sub>3</sub> , 1-2 min; add 5 dr pyrophos-tartrate (see Ni); stir and add excess solid Na <sub>2</sub> CO <sub>3</sub>	Filter paper soaked in 1 pct KBO <sub>3</sub>	Away from direct sun light add 1 dr benzidine (see Cr)	0.2 pct or more, blue green; less than 0.2 pct requires 30-60 sec.
Silico-Mn Steel	1 dr conc HNO <sub>3</sub> ; after short action wipe off with filter paper	1 dr 10 pct AgNO <sub>3</sub> on passivated metal which fills rapidly with Ag crystals	Add solid ammonium persulfate and mix	Golden crystals confirm silicomanganese steel
<i>As differentiated from:</i>				
Carbon Steel	Treatment same as Silico-Mn steel		Ag crystals start separating at bottom of drop	Persulfate produces color due to Mn

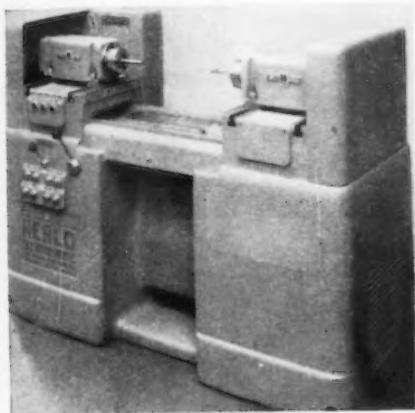


# New Equipment . . .

**A horizontal power press inclinable to 25°, single and double end boring machines, and a multiple spindle surface grinder and polisher are featured as new equipment developments. Also, a sequence control for spot welding aluminum, a high temperature laboratory furnace, and a gear tester are described, together with various small tools and attachments.**

## Boring Machines

**S**INGLE end Model 121 and double end Model 122 small Bore-Matic machines which can be arranged with one or two spindles, have been announced by *Heald Machine Co.*, Worcester 6, Mass.



These models are capable of finish boring, turning, facing, chamfering and grooving or flycutting. Table traverse is said to be exceptionally fast and large idlers have been employed to increase V-belt life. Reverse dog and positive stop are adjusted simultaneously. Hydraulic operation is not affected by oil temperature, it is said. Motors and pumps are mounted off the machine to avoid vibration. Lubrication is permanently sealed.

## Air-Operated Presses

**A**SERIES of air-operated presses for tool and die shops or manufacturing plants has been announced by *Dake Engine Co.*, Grand Haven, Mich. All force is applied by air pressure. Presses are available with either of two style pumps, one providing rated tonnage of the press at 145-lb air pressure, the other at 90-lb air pressure. A special safety valve prevents overloading of equipment, regardless of air pressure, it is said. The

series is available in 25, 50 and 75-ton capacities.

## Surface Grinder

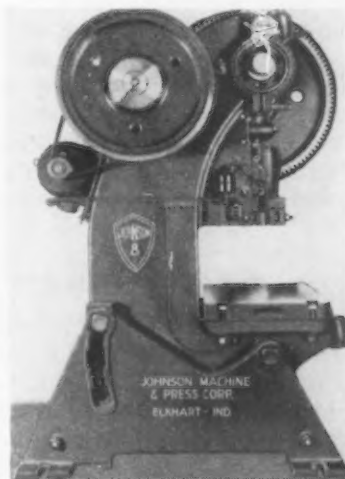
**A** NEW hand-feed surface grinder designed to grind tools, dies, chip breakers, and other toolroom jobs, has been announced by *Covel Mfg. Co.*, Benton Harbor, Mich. Convenient grouping and location of controls offer maximum accessibility from any working position. In setting up a job the operator has only to bring the wheel to the work and begin grinding; there are no dogs or feeds to set or adjust. Precision ball bearing sealed-for-life spindle is said to insure fine finishes. Smooth table operation is accomplished through hardened spiral pinion and rack. Ways are dust protected and motor is enclosed in the base. The working surface measures 5 $\frac{5}{8}$  x 10 $\frac{3}{8}$  in. The table will accommodate Walker or B&S



No. 510 chuck. Longitudinal travel measures 12 in.; cross travel, 6 $\frac{1}{8}$  in. The grinder is furnished either bench or floor type.

## Inclinable Power Press

**A**NNOUNCEMENT of a 90-ton horizontal power press inclinable to 25° to permit work to drop away without use of an ejector, has been made by *Johnson Machine & Press Corp.*, Elkhart, Ind. The

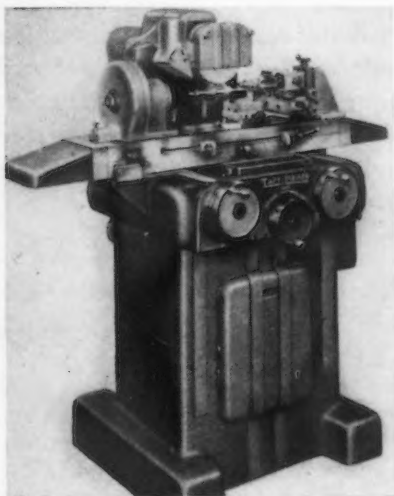


press is designed to handle work up to 15 in. in depth and to produce 44 pieces per min. Extra thick bolster plates provide strength for heavy operations without reducing die space. A tripping device is incorporated to protect the operator in case of spring breakage. Capacity of press at bottom of stroke is 90 tons, with a standard stroke of 4 in. and a special stroke of 9 in. The press is powered by a 7 $\frac{1}{2}$  hp motor operating at 1800 rpm.

## Spline and Gear Grinder

**A**DAPTED for the grinding of precision gears and splines of small and medium size, a grinder, announced by *Taft-Peirce Mfg. Co.*, Woonsocket, R. I., is said to produce fine-pitch gears and splines to exceedingly close tolerances. Net clearance from the center line of the work arbor to the surface of the table is 4 $\frac{1}{4}$  in. Distance between centers accommo-

dates an 8-in. arbor. This grinder has hardened and ground ways, ball mounting of table, saddle, and column, and an anti-friction bearing spindle in the head stock. Auto-



matic indexing is provided at the end of each stroke. Backlash and play are said to be eliminated by a special driving dog with clamping device. Wheel dressing is accomplished with a 3-diamond dresser attached in line with the work arbor.

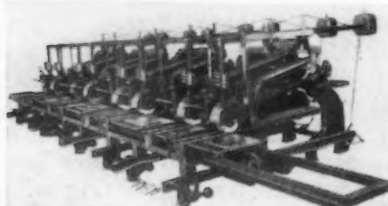
#### Portable Turning Machine

DEVELOPMENT of a portable turning and grinding machine to be used to re-turn and finish by grinding worn and cut crank pin journals on steam locomotives without having to dismantle any part of the locomotive except the rod from the crank pin to be re-turned, has been announced by *C. E. Marsh*, P. O. Box 289, Atlanta, Ga. The machine is self-contained with a stationary spindle and a rotating cylinder with a sliding tool bar, equipped with automatic gear driven feeds, reversible, a detachable tool head for turning tools, a detachable grinding head to finish a crank pin or end journal after the journal has been turned. The machine is precision built with selected materials for long service. The machine

will turn and finish by grinding crank pins, end journals on shafts from 4 to 12 in. diam, any length journal from 0 to 20 in. The machine can be furnished with adapters for turning any type or style end journal.

#### Multiple Spindle Grinder

DESIGNED for grinding and polishing flat or semi-flat surfaces, an automatic high-speed ball bearing multiple spindle machine No. 27 FM has been announced by *Excelsior Tool & Machine Co.*, East St. Louis, Ill. The continuous production machine illustrated, shows an 8-wheel machine designed for stove tops, which are mounted on separate removable follow boards, adjustable hold down fixtures re-



taining the covers in place. Heavy safety wheel hoods and an improved dust collecting system are other features. The machine is shipped assembled in sections, complete with ball bearings, totally enclosed, dust proof, fan cooled motors, with magnetic switches and push button controls. Four, 6, 8 and 10-wheel machines are available.

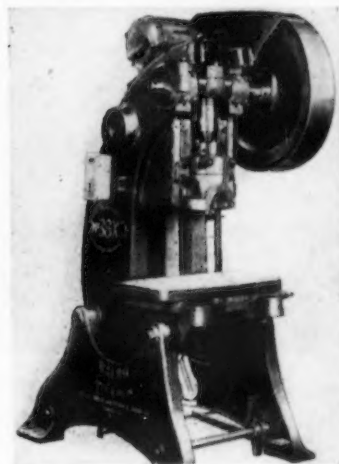
#### Creep Test Furnace

FOR making creep or stress-strain-rupture tests at elevated temperatures, *L. H. Marshall Co.*, 270 W. Lane Ave., Columbus 1, Ohio, has developed a high temperature furnace. It is said every feature was designed to provide uniform temperature distribution and accurate temperature control. Temperature uniformity of  $\pm 3^\circ\text{F}$  over the gage length of the specimen can be obtained, it is claimed. The furnace operates on 110 v, has maximum temperature of  $1800^\circ\text{F}$ . It measures  $1\frac{1}{2}$  in. ID x 6 in. OD x

16 in. long. Window openings are  $\frac{1}{4} \times \frac{1}{2}$  in. A similar furnace, but without windows, is available for high temperature tensile tests.

#### Inclinable Punch Press

VERSATILITY is said to keynote a 38-ton capacity, open back, inclinable punch press manufactured by *Walsh Press & Die Co.*, 4709 W. Kinzie St., Chicago 44. In the tool room the press can be used for shearing-in of dies and punches and for die try outs. The large shut height and bolster plate area also make this press adaptable to certain notching, forming and die-casting trimming operations where plenty of room is required. This Model 38X has a distance between gibs of 17 in., a bed area 18 x 26 in., and a throat depth of 12 in. It can be furnished with up to a 6-in. stroke in either a flywheel type or a back geared type and with either



a variable speed drive or conventional motor drive. The standard design features of all the Walsh presses are included in this model.

#### Aluminum Spot Welding Control

DEVELOPMENT of a sequence control capable of converting ordinary resistance welders to the production of spot welds in sheet aluminum and other nonferrous metals has been announced by *Acro Welder Mfg. Co.*, 1825 W. St. Paul Ave., Milwaukee 3. Known as the Acro aluminum sequence control, the unit has been designed for use with any type air-operated spot welder. Operating principle is described as a refinement of the forge-delay principle. It is said to work in conjunction with standard transformer type ac air-operated welding machines, timers and con-





tactors. The calibrated dial-type timer of the control is said not to be affected by line voltage change. Two sizes fit the range of air-operated spot welders. A toggle switch



is incorporated to permit the operator to return the spot welder instantaneously to regular welding.

#### Moisture Evaporation Meter

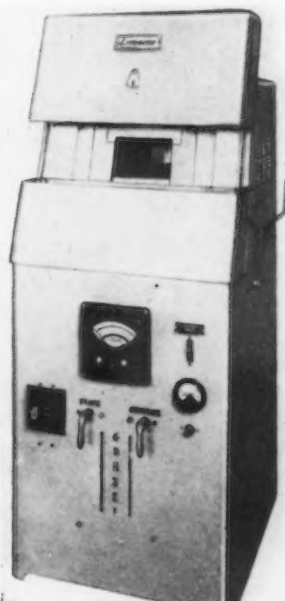
DESIGNED to measure the evaporation of moisture from sand molds, an instrument called the Electric Hygro-Cel has been announced by *American Instrument Co.*, Silver Spring, Md. By placing the Hygro-Cel in contact with the surface of the mold, the evaporation of moisture can be accurately measured. The instrument consists of an electric hygrometer sensing element mounted in a special, ruggedly constructed housing. The operating principle of the sensing element is based on the ability of a hygroscopic film to change its electrical resistance instantly with micro-changes in moisture content. Two types of housings are offered measurements of which do not exceed  $1\frac{1}{4} \times 2\frac{1}{4} \times 3$  in. It is said only 30 sec are required to take a reading with the instrument.

#### Thermocouple Protecting Tube

DEVELOPMENT of a process and method for making a heavy-wall, cast-iron, thermocouple protecting tube has been announced by *Claud S. Gordon Co.*, Chicago 12. It is reported these Serv-rite tubes are cast with both ends open, and a special technique is employed for weld-closing one end. Porosity in the casting is eliminated by the addition of a small amount of alloy element. It is said X-ray inspection reveals uniform wall thickness, freedom from casting defects and good welding. Serv-rite tube is furnished with a  $\frac{3}{8}$ -in. wall thickness and a 15/16-in. ID.

#### Laboratory Furnace

A BOX-TYPE laboratory furnace with temperatures up to 3000°F top heat, and for continuous operation as high as 2500°F has been developed by *Lindberg Engineering Co.*, 2444 W. Hubbard St., Chicago 12. This self-contained unit may also be used as a muffle furnace, or with carbon blocks for nonoxidizing atmospheres. The 3000°F top heat capacity provides heat at any lower level more quickly and the 10 silicon carbide Globar heating elements insure uniform heating, it is said. Furnace temperatures are regulated by an indicating-controlling pyrometer with electronic circuit. Model G-10 is designed for operation on

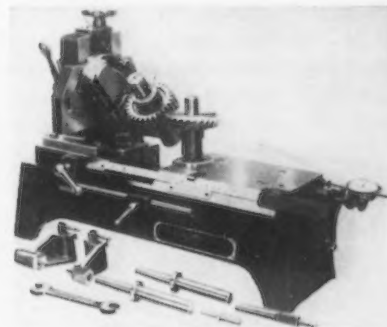


230 v, 60 cycle, single phase ac. A variable voltage transformer, contained within the unit, has a capacity of 8 kw and is used in conjunction with two tap switches, each of which has six control points for voltage regulation.

#### Gear Tester

THE 9-in. Parkson gear tester has been completely redesigned by streamlining the base and other main parts and by adding changes that make for more efficient operation of the machine, *George Scherr Co., Inc.*, 200 Lafayette St., New York 12, the distributor has announced. Improvements incorporated an adjustable stop-rod, and a precision scale and long vernier which are used for the setting of the center distance. Scale setting does not have to be repeated when a number of gears

of the same size are to be tested. Instead, the stop-rod is set and clamped in position. The machine



is available for spiral, spur, bevel, and worm gears, either in combination or single purpose models.

#### Tool Bit Kit

A PRECISION kit which is a special Plexiglas box containing 12 tool bits from 3 to 16 in. square to 3 to 8 in. square in three grades of cutting metal has been marketed by *Redhard Metals, Inc.*, North York Rd., Hatboro, Pa. Tool steels are Redhard precision high speed, precision nonferrous and precision carbide. The P.N. and P.C. are tipped tools.

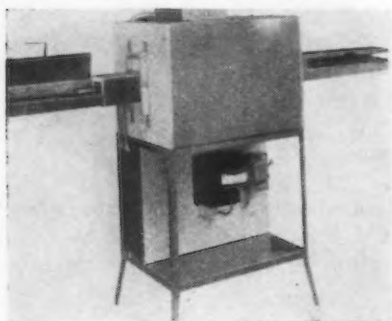
#### Protective Coating

A PROTECTIVE-COATING compound for metal surfaces, developed by *Arco Co.*, 7301 Bessemer Ave., Cleveland 4, is a weather resistant, water-repellent material, known as Dum Dum for Metal. By forming a tough but elastic and pliable coating that seals out measurable vapor, moisture, chemical gases and fumes, the new material prevents corrosion and deterioration of metal surfaces from these sources. If the outer skin of the protective film becomes bruised or broken, the film's exposed undersurface hardens and heals itself, the manufacturer states. Uniform coverage and maximum surface protection are obtained through spray application of the material, which is said to be suitable for use on new or uncoated structures and also over previously coated surfaces, excepting those with bituminous-type coatings. Surface preparation consists of cleaning and priming

#### Tunnel Kiln

A TUNNEL kiln for small batch production work, firing of ceramic parts, and production heat treating of small parts, has

been announced by *K. H. Huppert Co.*, 6830 Cottage Grove Ave., Chicago 37. This kiln has an electric heating element which provides a maximum temperature of 2200°F. It is a pusher type, with small refractory trays being pushed through the inside of the 33-in. firing chamber by means of a variable-speed



drive. The firing zone is 10 in. long and tray size is  $2\frac{5}{8} \times 3\frac{3}{4}$  in. The unit is housed in 14-gage enameled steel. Equipment includes a No. 221 Wheelco Capacitrol for automatic temperature control, fused switch box and step-down power transformer. The kiln operates on single phase, 110 or 120 v ac and has a current consumption of 2 kw.

#### Humidity Indicator

SAID to provide readings of relative humidity accurate within 1 pct for general conditions, a quick-reading all-metal humidity indicator has been designed for industry and laboratory use, by the *Weston Electrical Instrument Corp.*, Newark, N. J. The instrument is of wet and dry bulb type,

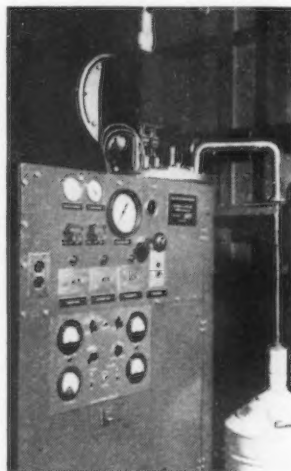


featuring all-metal Weston laboratory thermometers, self-supporting wet-bulb wick covering the thermal element, and a simplified slide rule calculator giving relative humidity reading directly. The unit is light and well balanced, it is said, and can be swung if desired to create

air movement. The only maintenance necessary is to change the wick and replenish the water in the reservoir.

#### Helium Liquefying Device

KNOWN as the Collins Helium Cryostat, a device which liquefies helium and can maintain any temperature down to 2° Kelvin, or -456°F, has been produced by *Arthur D. Little, Inc.*, Cambridge, Mass., for use in research laboratories. The cold space of the Cryostat and part of the refrigerating equipment is contained within a steel vacuum jacket 12 in. in diam x 5 ft tall, which is housed within a cabinet measuring 3 x 2 ft. Other equipment includes a 10 hp compressor and a low-pressure gas holder. The complete unit weighs 2800 lb and occupies less

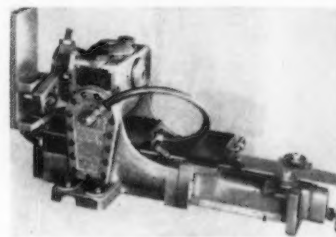


than 50 sq ft of floor space. Helium is the only refrigerant used. Liquid helium or other liquefied gas can be removed from the equipment. Technical features of the Cryostat include a heat exchanger which cools the compressed helium from room temperature to liquid-helium temperature, and a piston and cylinder expansion engine. This engine uses a flexible connecting rod in tension, which aligns a hardened, closely fitting piston within the cylinder and permits it to operate at extremely low temperatures without lubrication. The device can be operated by laboratory technicians without attention by the scientific personnel, it is reported.

#### Hydraulic Stock Feed

A HYDRAULICALLY - OPERATED stock feed for use on almost any punch press has been announced by *Haller Machine &*

*Mfg. Co., Inc.*, 7940 Tireman Ave., Detroit 4. The unit handles stock up to 4 in. wide x  $\frac{3}{32}$  in. thick and feeds any desired length from 0 to 5 in., within 0.003 to 0.005 in. Known as the Haller model D-600, the unit is compact and entirely self-contained. It is mounted on the



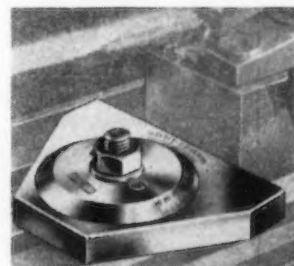
bolster plate of the press and can be located to feed from the left, right, front or back. It is driven directly from the press ram, with any ram stroke up to 6 in., and is said to have sufficient power to pull the stock through a roll-type straightener.

#### Air-Powered Drills

A STRAIGHT type and pistol grip type of air-powered hand drills are being distributed by *Air-Speed Tool Co.*, 1500 W. Slauson Ave., Los Angeles. Controllable speed regulation, simplicity of design, high speed, light weight, and cool operating characteristics are features of the new drills. The tools are designed to operate at air pressures of 90 to 100 lb. Air consumption is estimated at 12 cfm at drill speeds of 14,000 rpm.

#### Machine Table Protractor

TO facilitate obtaining angular locating or working surfaces on milling machine or other machine tables, *Taft-Peirce Mfg. Co.*,



Woonsocket, R. I., has made available a machine table protractor with a graduated index plate which includes a vernier scale to accomplish accurate settings within 5 min of the angle. The tool is designed to accommodate standard size tongues to fit conventional T-slots.



### Spray Gun

**S**AID to handle all types of finishes, a high precision production spray gun, the Model 18, has been announced by *Binks Mfg. Co.*, 3116 Carroll Ave., Chicago 12. Controls are located at the back of



the gun. The spray pattern is adjustable from round to flat with all intermediate patterns. The gun body is of aluminum, the gun head and air nozzle of bronze, and the material nozzle of hardened steel. The gun has two-finger trigger action.

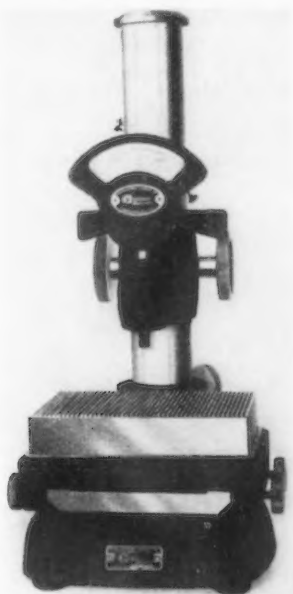
### Hole Punching Unit

**B**Y designing the EJ hole punching unit with a center projection to carry the die, punching a series of holes simultaneously in angles, channels and extruded shapes is possible, the manufacturer, *Wales-Strippit Corp.*, North Tonawanda, N. Y., announces. The center projection may be located to punch these various extruded sections. Units are independent and self-contained. Nothing is attached to the press ram. All functioning parts—punch, guide, stripping spring and die—are built in the holder which automatically aligns the punch and die. In action, the full-floating punch located in the top of the holder is depressed by the press ram and is guided through the work and into the die by a long guide. On the down stroke of the ram, the stripping spring is compressed and on the upstroke expands to strip the punch from the work. For the strip template method of setups, hole locations are drilled and reamed in the strip template for the pilot pin.

### Comparator

**P**ROVISION for five interchangeable tables and the use of standard indicators are features of the Model 108 comparator developed by *Standard Gage Co.*, Poughkeepsie, N. Y. This comparator is suited to a wide range of production and inspection measuring jobs and

when equipped with the Micronar indicator, it affords a means of checking plug gages. Raising, lowering, and approximate positioning



of the indicator support arm are facilitated by a rack on the rear of the column. Fine adjustment for setting the comparator to a standard is effected by a wing handle. Pressure of the contact point on the work piece can be regulated by means of a knurled bushing. Tables are available in 1½ x 4 in. and 6 x 4 in. serrated, 1½ x 4 plain, and one with 1½-in. diam rolls for checking lobal conditions.

### Back-Stand Idler

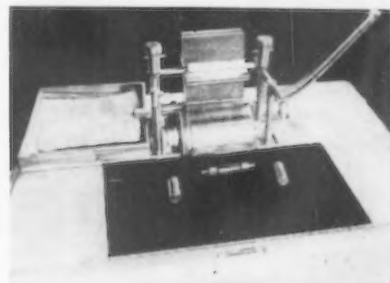
**C**ONVERSION of standard polishing lathes to abrasive belt polishing without additional floor space is made possible by Presto universal back-stand idlers, announced by *Manderscheid Co.*, 810 Fulton St., Chicago 7. The unit



operates on wall, ceiling, floor, or bench. Leaf spring tension with a 12-in. adjustment keeps the belt tight. Belt tracking is adjusted at the operator's position. The pulley can be changed from right to left-hand operation.

### Automatic Feed Attachment

**F**EEDING, holding, and ejecting are accomplished automatically with an automatic feed attachment designed by *Size Control*, 2500 Washington Blvd., Chicago, for use on their centerless lapping ma-



chine. The operator, after adjusting tension on holding applicator, has only to keep the feed chute loaded with pieces to be lapped. Cylindrical pieces feed in between lapping rolls, are lapped to a precision finish of less than 2 micro-inches as they move to the left under the holding vane, and are ejected at the opposite end. Adjustable spring tension on holding applicator determines pressure that will be applied to cylindrical pieces as they are lapped.

### Chemical Cleaner

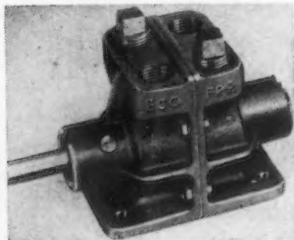
**F**OR on-the-spot indoor cleaning of industrial machinery, conveyor systems, engines and other equipment in factories and foundries, a portable electrically heated chemical cleaner has been manufactured by *Hartman Corp. of America*, 5147 Natural Bridge Ave., St. Louis 15. A constant-pressure anti-splash spray nozzle automatically regulates the spray pattern for high temperature cleaning and creates a high-powered pulsating stream of atomized super-heated water and chemical solution for cleaning and flushing. It is said injurious fumes, vapors, and chemical laden steam are eliminated, thus protecting nearby highly polished surfaces. Fire and explosion hazards are prevented by multiple safety devices. A ceramic core boiler fitted with immersion heater heats water from tap temperature to operating temperature in approx 1 min, it is reported. Another feature is a Thermo-Flo valve that maintains uniform water temperature both summer and winter. The cabinet is less than 2 ft square.

### Adjustable-Blade Fans

**A**NNOUNCEMENT of a new line of Axivane adjustable-blade fans, Series 1000, for all heating, ventilating, and air conditioning requirements has been made by Joy Mfg. Co., Oliver Bldg., Pittsburgh 22. The Series 1000 consists of axial-flow fans of the vaneaxial type designed for a range of pressures up to 9.60 water gage and volumes up to 100,000 cfm. Fans are available in 124 different models, from various combinations of 15 different housing diameters, 18 to 60 in., 4 hub sizes, 16 motor-frame sizes, and 4 different speeds.

### Gearless Pumps

**A**NEW line of gearless pumps for general industrial use has been announced by Eco Engineering Co., 12 New York Ave., Newark 1, N. J. Chief among the improvements in the pumps is their double impeller design which gives a



strong flow against pressure, and the impellers, which are made of special wear-resistant materials, can be adapted to the operation involved. Pumps are available in  $\frac{1}{4}$  and  $\frac{1}{2}$  in. sizes, capacities from 1 to 12 gpm varying with pump speeds and pressures. They can be used against pressures up to 50 psi and will deliver at speeds from 200 to 3500 rpm. Pump bodies are available in stainless steel, Monel, and bronze.

### Enclosed Thermocouples

**P**RODUCTON of a complete line of enclosed thermocouples for general foundry use interchangeable with existing equipment, has been announced by the Industrial Instrument Service Co., 2785 Slau-son Ave., Huntington Park, Calif. Thermo-Tips are constructed in one piece in any length or shape. These increased lengths bring the connecting junction outside the retort. Thermo-Tips are supplied as standard in 18 and 24 in. lengths, straight or with 45° or 90° bends

using 16 gage matched chromel-alumel elements. For special purposes and where extreme sensitivity and rapid temperature indication are required matched thermocouple wires of 20 gage size or of iron-constantan can be supplied to order.

### Platform Utility Truck

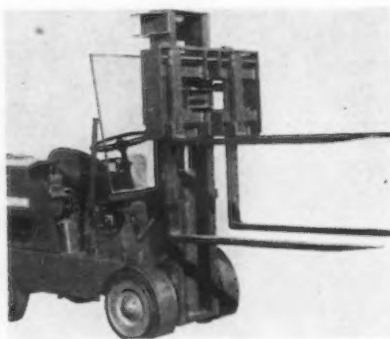
**D**ESIGNED for odd jobs requiring a light platform truck with large deck space, a truck introduced by Truck-Man, Inc., Jack-



son, Mich., turns in its own length. The platform is 36x66 in. Wheel-base is 72 in.; overall length is 108 in.; ground clearance, 5½ in.; loading height 16 in.; capacity, 1500 lb. The truck is equipped with four pneumatic industrial tires. A two-speed transmission allows a high and low speed in forward or reverse.

### Lift Truck Accessories

**A**LARGE, heat-resistant glass shield, a double set of forks and a pair of tire guards, all installed on a standard model LT-56 fork lift truck manufactured by Towmotor Corp., 1226 E. 152nd St., Cleveland 10, provide a safe, time-saving means of charging heat



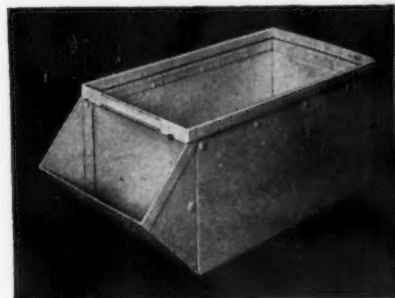
treat ovens with castings, it is reported. The shield is a 40-in. sq blue-colored glass; tire guards extend down over the front wheels; and the dual forks are spaced 25 in. apart enabling two separate containers of castings to be picked up simultaneously. Model LT-56 has a capacity of 4000 lb, has non-telescopic lift, and a maximum of 65 in. lifting height.

### Paste Solders

**S**OLDERS in paste form, easy to apply and said to open up new fields for production methods and maintenance repair work, have been announced by Fusion Engineering, 1836 Euclid Ave., Cleveland 15. These chemical paste alloys contain the flux, cleaner, tinning agent and actual metallic solder complete. The paste can be applied automatically or by hand before soldering and then parts can be heated at once or fed automatically to the heat. Super solders cover three temperature ranges: low temperature alloys—200° to 500°F; medium—500° to 750°F; brazing alloys, 1150° to 2000°F. They are also separately compounded for each type of application or material.

### Aluminum Containers

**H**EAVY gage aluminum portable containers have been added to the line of steel containers manufactured by Stackbin



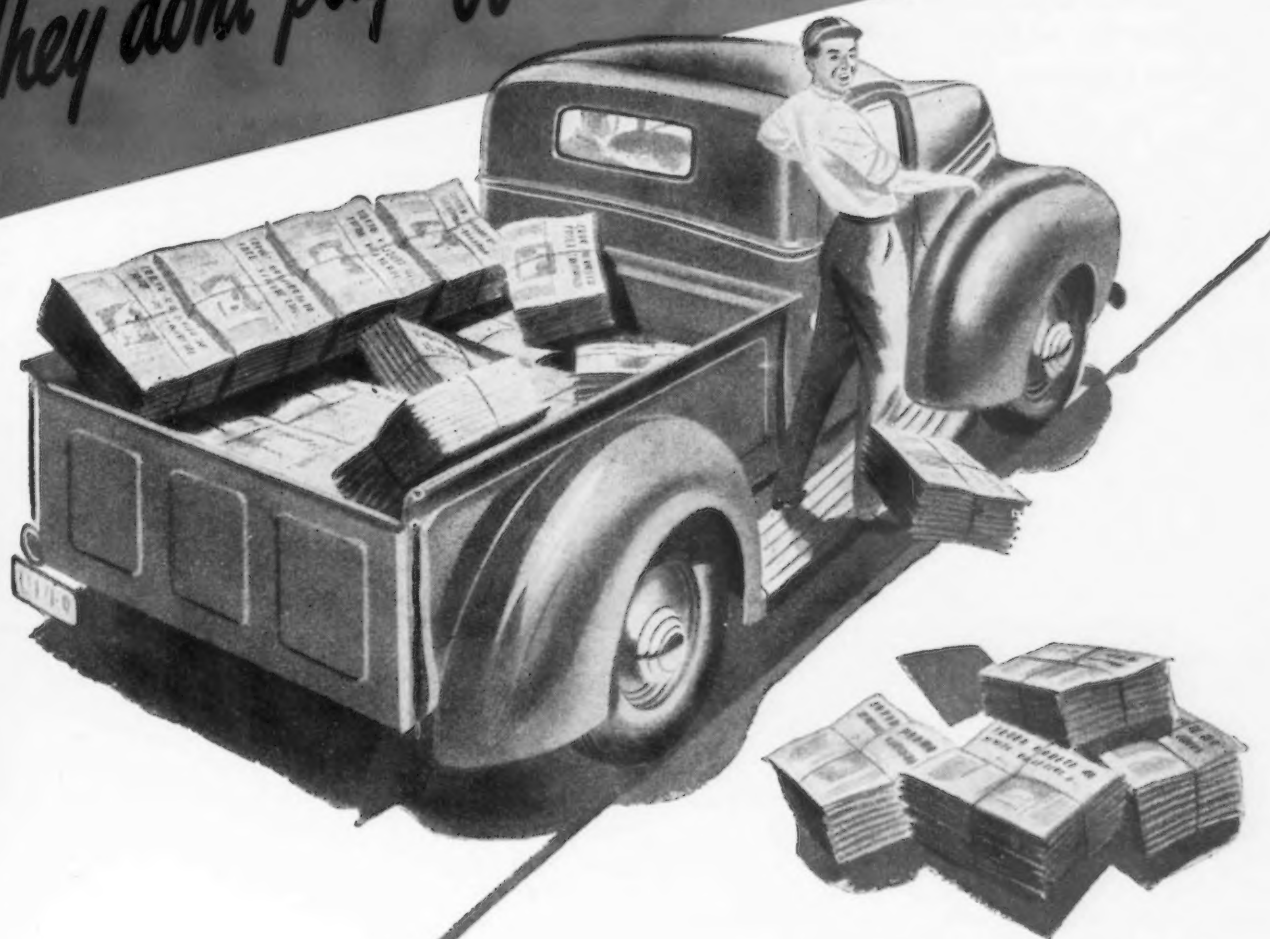
Corp., Pawtucket, R. I., which are said to be substantially sturdy, light in weight, weighing 1/3 as heavy as steel. They are hopper fronted stacking bins designed for storage transportation and assembly of tools, parts and materials.

### Dust Wetting Agent

**C**OMPOUND M is offered by Johnson-March Corp., 52 Vanderbilt Ave., New York, for the control of siliceous sand dust to prevent inhalation and to alleviate general dust conditions. Combined with water, the compound is sprayed over sand and dirt on floors to prevent stirring settled dust. With water, it is sprayed into the air through misting nozzles to cause the dust particles to fall to the ground. This material is made as a concentrate, solid in cartridge form, and dissolves automatically when water is introduced through a flow proportioning device.



*They don't pay off on* **DEADWEIGHT**



When frame, body panels, fenders, wheels and other structural parts are made of N-A-X HIGH-TENSILE, a truck uses its horsepower to deliver goods, not deadweight. The high physical properties of N-A-X HIGH-TENSILE make possible weight savings up to 25% in section, yet maintain superior strength and have increased resistance to fatigue, corrosion, abrasion and denting.

On the job, the savings in pounds mean a savings in dollars. Gasoline economy is improved. Maintenance costs are reduced. Life factor is increased.

If you make a product that moves, it will move more efficiently and economically through the application of N-A-X HIGH-TENSILE. Good formability, excellent weldability and fine surface texture for finishing make N-A-X HIGH-TENSILE a great steel to work with, too.

MAKE A TON OF SHEET STEEL  
GO FARTHER

*Specify-*



## GREAT LAKES STEEL CORPORATION

N-A-X ALLOY DIVISION • DETROIT 18, MICHIGAN  
UNIT OF NATIONAL STEEL CORPORATION

# Assembly Line . . .

WALTER G. PATTON

• Windshields with new curved glass introduce many problems for car producers . . . GM Corp. disqualifies dishonest dealers . . . Hudson's recent strike poses a new labor problem.



**D**ETROIT — Curved windshields will undoubtedly prove a popular feature in the new postwar cars. However, behind the change from flat glass windshields to curved glass lies one of the longest chains of headaches the auto industry has ever forged for itself.

The impetus favoring curved glass windshields goes back to the car designers themselves who found out some time ago they could do things with motor cars having curved glass that were not possible using flat glass. This started the agitation in favor of curved glass windshields, it is reported. From that time on, there have been obstacles all along the line and only recently has the last of these been surmounted.

The first big hurdle, it is reported, concerned factors of visibility and reflection. A research program finally disposed of this objection by showing that up to a certain degree of curvature, curved glass windshields could be used without sacrificing visibility. This is a fairly well-defined area, it seems, but car manufacturers are willing to assure you that visibility is not sacrificed in the new curved windshields.

The next obstacle came from

the glass makers who not only indicated the cost would be much too high but insisted that it seemed like plain foolishness to insist on making curved laminated glass when "the industry has been trying for the last 25 or 30 years to make glass that is perfectly flat." When it was indicated that the auto industry was apparently ready to pay the extra cost—estimated to be nearly four times the cost of flat laminated windshields—the glass industry still had the problem of setting up new production lines and learning the art of making precisely curved glass *that has all of the properties of flat glass.*

This was only the beginning, however. Car manufacturers soon found they had a new inspection problem confronting them. It is customary to place the clearest side of a windshield on the driver's side and in a flat windshield this can be done by merely reversing the glass. No such switch is possible, however, in a curved windshield. Therefore, rejections are bound to increase. But this is only the first assembly problem.

**F**LAT glass with a nicely rounded edge will take considerable abuse, it is said, without breaking, whereas curved windshields permit very little "fitting." This increased the number of rejections—at least in the beginning. However, the art of "floating" the curved windshield in the body opening was soon mastered, which left only the problem of insulating the windshield to keep out the rain under all kinds of driving conditions and in all degrees of heat. This problem, too, has been a difficult one, it is said, giving the industry some troublesome moments.

While few motorists will appreciate the fact, most of the new curved windshields of individual manufacturers have different degrees of curvature. The Studebaker windshield, for example, is less curved than the new Hudson. As a general rule, the more curvature the more difficult it is to get a perfect fit. From this standpoint, the industry has only begun to think up new manufacturing problems for itself, according to some sources.

Assuming, however, that the glass maker and the car manufacturer have all solved their respective problems, there is still the service problem to be considered. If the windshield is the split type your service station will now have to carry both left and right windshields in stock. And the problem of fitting the new windshields into place will be just as difficult for the service man as it was for the manufacturer—perhaps more so. Also, your service man may not have the exact size required.

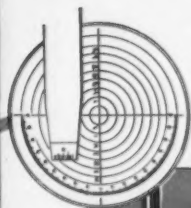
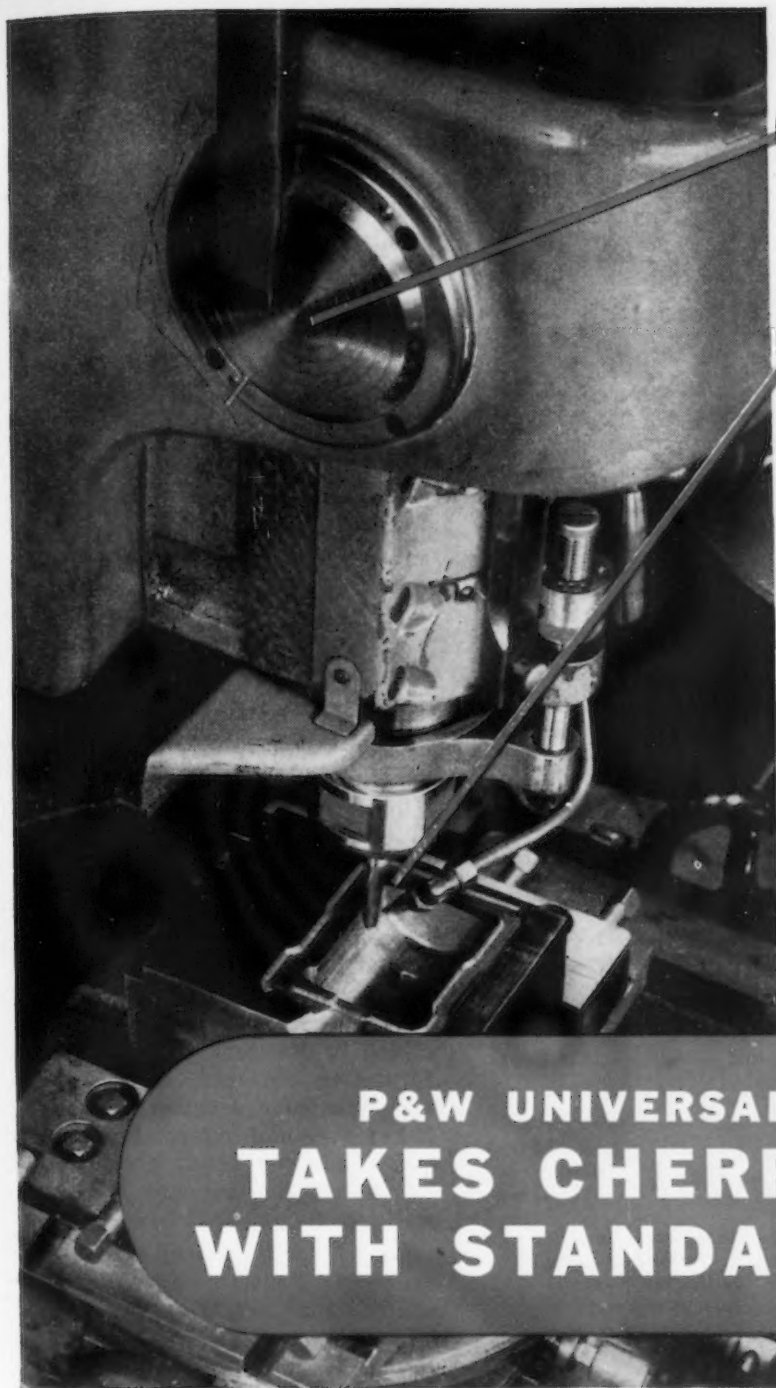
Given time, the industry hopes to solve all of these problems in connection with curved glass windshields. In the meantime, it should have a right to explain that it has had more than a little difficulty bringing itself around to the idea of curved glass windshields—no matter how attractive they may seem to be to the prospective car buyer and the new car designers.

It now appears to be reasonably certain that automobile dealers who are guilty of racketeering are going to have rough going from here on in. During the past week General Motors ordered cancellation of the franchise of Hacquoil Buick Sales, Detroit, the second largest Buick dealer in the entire country. GM has also let it be known that it is making its own investigation and will act on its own findings regardless of what may be done by the courts.

**I**N Detroit Judge W. McKay Skillman's auto rackets grand jury has indicted several GM franchise holders. It has recently been disclosed that GM investigators are completing a check of Skillman's accusations against two other Detroit dealers. If the corporation confirms the charges, immediate cancellation of the dealer's contract will follow, according to a GM spokesman.

While no official statement has been made by other producers in the industry, it seems a fair conclusion that some at least, if not all, will follow the GM lead. As many auto executives see the picture, auto dealers who have fattened themselves on profits over and above the lush margins they have been earning through legitimate transactions are hardly de-

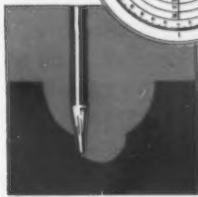
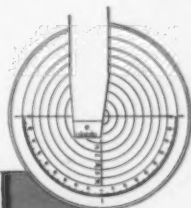




Indicator marks position of cutter making finishing cut over cylindrical cavity in tough die steel. Oscillating head makes easy work of many jobs that are either very difficult or impossible with ordinary die sinking equipment. With work held in a rotary vise, this can become a spherical cavity produced with equal ease.



Machine can take cherrying cut at bottom of any cavity, indicator again showing radius of cut. With work in rotary vise, this also can be a spherical cavity.



For convex cylinders or spheres, cutter is set to move through upper half of oscillator travel. Straight cuts, cylinders and spheres, concave or convex, 180° or any part of it, on any radius within limits... all are part of the day's work. These are the three basic cuts. Combinations of them in whole or in part are endless.



## P&W UNIVERSAL DIE SINKER TAKES CHERRYING CUTS WITH STANDARD CUTTERS

This feature gives you better dies at less cost wherever you put it to work. The P&W Universal Die Sinker's oscillating head, operating through adjustable eccentrics, does the job and eliminates much expensive hand finishing. This powerful modern machine lets you hog out heavy cuts, then finish so accurately that hand work and polishing is a

matter of minutes. *And all this with ordinary, low-cost die-sinking cutters.*

Machine shown in the photo is Pratt & Whitney Universal Die Sinker 3B, one of a complete line you may have seen in action at the recent Machine Tool Show. Bulletin, sent on request, covers all models, both Plain and Universal.

# PRATT & WHITNEY

Division Niles-Bement-Pond Company

WEST HARTFORD 1, CONNECTICUT



serving of sympathy or special consideration.

From the outset GM has insisted in answer to direct questions that it is willing to act whenever or wherever charges against one of its dealers can be *proved*. The recent action of GM sales executives is apparent proof that the corporation meant exactly what it has been saying.

Coming at a time when it was just pulling up to satisfactory production levels after its recent model change, the strike at the Hudson plant which stemmed from the demands of 21 arc welders for wage increases was unfortunate for both Hudson and its workers. According to the terms of the agreement with the union no strikes are possible over wages at this time. The union's position in the controversy is that there was no necessity for sending home 12,000 workers even though 18 workers did quit their jobs. The company has replied to this charge by saying that key work on the new models was being held up and that it was not possible to continue certain operations; therefore, the workers had to be sent home.

It seems only just to point out, however, that new work in connection with the assembly of the

"wheel-barrow" on Hudson's body-and-frame construction was involved. Under the circumstances there was undoubtedly room for an honest difference of opinion between the company and the union over the wages to be paid for the new work. Hudson workers are back on the job again and the company is preparing to offer the union some new terms for possible settlement of the controversy.

An event unique in the history of the automobile industry was held in Detroit this week when 40 winners of new automobiles in the GM "My Job Contest" were guests of GM Corp. Top GM officials, including Pres. C. E. Wilson, congratulated their employees enthusiastically and indicated by their remarks that this may be only the beginning of a well-integrated employee relations program to induce employees to think constructively about their jobs.

**I**N any event, it marked the best organized attempt by a motor car producer to combat the endless stream of "literature" that pours out of UAW-CIO headquarters here in Detroit.

The GM contest which closed Oct. 31 drew more than 174,000

entrants or 59 pct of all eligible GM employees. From a geographical standpoint the 5145 prizes were well distributed with three GM divisions, perhaps with some "encouragement" from top management, turning in 100 pct entries. One manufacturing division—Moraine Products at Dayton—turned in entries for more than 99 pct of its eligible employees.

As a new activity for GM, the My Job Contest presented some interesting problems. A large number of entries were submitted in foreign languages and therefore required the use of interpreters. One letter was written in Braille; another was submitted in Arabic, it is reported. The entire stack of letters, so GM statisticians figured, would make a pile six stories high.

The fact that the union had once referred to the contest as a huge bribe was undoubtedly much less important than the fact that GM had actually obtained a large amount of valuable personal opinion from its employees. Even though the skeptics might be inclined to discount heavily the information obtained, at least GM will now have a better idea than it has ever had before about what GM employees *think* they would like about the company they are working for.

L. W. Ward, general sales manager of Pontiac, has recently mailed out 200,000 personalized letters to purchasers of 1946 and 1947 models. Sales officials have explained that the letter has been designed to counteract a widespread feeling that may be held by the public that in this seller's market, the buyer's purchase of a new car is not properly appreciated.

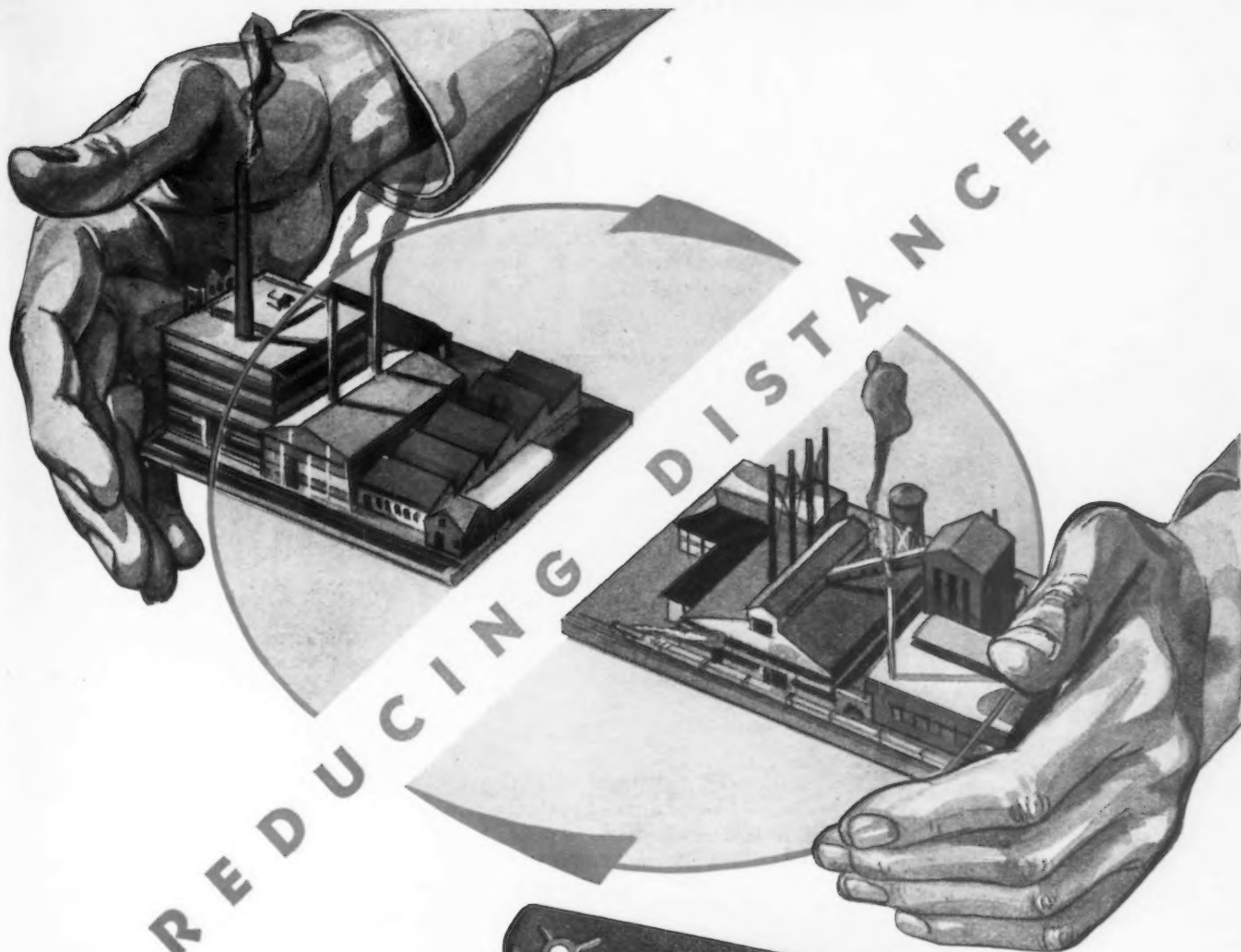
"We do not feel this way about it," Ward commented, "and neither does any right-thinking dealer. A satisfied customer is just as important today as at any other time, regardless of the fact that prospective buyers far outnumber the Pontiacs available."

Apparently, Pontiac is taking no chances that its goodwill will sag during the present situation in which real selling effort has all but vanished from the automotive field.

**CRADLE FOR A CONVERTIBLE:** Studebaker has inaugurated a new technique for assembling the 1948 convertible models. Instead of using the flat bed of the conventional dollie, a regular Studebaker frame is welded to the dollie. The body is bolted to this frame at the start of production and continues on the same dollie through subsequent manufacturing operations.







## Transue

succeeds in bridging the hundreds of miles from Alliance to its most distant buyers... bringing to remotely situated users of steel stamping parts every advantage enjoyed by the closest customer. Transue's extensive facilities permit the gearing of delivery schedules to every requirement of the parts user, with more than ample allowance for time in transport. The uniform quality and accuracy of T & W parts eliminate any further possibilities of trouble. Distance is reduced to a negligible factor under these conditions... with Transue's delivery of stampings that are *right the first time*, that arrive *on time*. It costs you nothing to call in a Transue specialist.



A. CYLINDER HEAD COVER FOR TRACTOR ENGINE—27-5/8" long, 6-5/8" wide, 3" deep.



B. PAN FOR 4-CYLINDER DIESEL—19-25/32" long, 10-7/8" wide, 7" deep.



Designers and Makers  
of Deep Drawn  
Stampings



SALES OFFICES: NEW YORK, PHILADELPHIA, CHICAGO, DETROIT, INDIANAPOLIS, CLEVELAND



**E. S. BOWERFIND**, director of public relations, Republic Steel Corp.

• **E. S. Bowerfind**, who for past 14 years has been associated with Hill & Knowlton, has been appointed the new director of public relations for Republic Steel Corp., Cleveland. Mr. Bowerfind worked for several years on Cleveland newspapers in editorial, advertising and promotional capacities. **Henry W. Hopwood**, also formerly employed by Hill & Knowlton, will be assistant to Mr. Bowerfind.

• **DeRoss Salisbury, Jr.** has been appointed abrasive field engineer for the Cleveland area of Norton Co.

• **W. T. McCargo** has been named assistant director of sales in charge of operations in the western region of the Carborundum Co., with headquarters in Chicago. Mr. McCargo had previously held the title of regional sales manager. **John S. Hawley**, formerly manager of the commercial research department at Niagara Falls, N. Y., has been appointed assistant director of sales in the central region with headquarters in Cleveland. **John G. Fritzinger**, formerly district sales manager of the company's branch at Philadelphia, has been appointed assistant director of sales with jurisdiction over the eastern region and his headquarters will be in Philadelphia. Succeeding Mr. Fritzinger as district sales manager at Philadelphia is **R. R. Huntington**. Previously Mr. Huntington was a member of the company's sales staff at Cleveland. These appointments are effective Jan. 1.

## PERSONALS

• • •

• **Samuel Insull, Jr.** has been elected vice-president of Stewart-Warner Corp., Chicago. Mr. Insull will continue in charge of the company's radio division. Prior to his appointment as assistant to the president of Stewart-Warner last January, Mr. Insull was vice-president of Central Barge Co.

• **Joseph A. Sullivan** has been named manager, advertising bureau, Universal Atlas Cement Co., New York, U. S. Steel subsidiary. Mr. Sullivan has also been appointed director of public relations. He succeeds the late Max A. Berns. Mr. Sullivan joined Universal Atlas Cement as assistant publicity manager in 1946.

• **Harry T. Silverman** has been appointed assistant superintendent of shops at Midland works, Crucible Steel Co. of America. He was formerly with Youngstown Sheet & Tube Co., Indiana Harbor works. Prior to that time he was connected with Standard Steel Spring Co.

• **Robert M. Gaunt** has been appointed to represent E. C. Atkins & Co. in the territory of southern Texas, New Orleans and Louisiana, with headquarters in Houston. During the war Mr. Gaunt was with the War Production Board, chief of materiel redistribution; later with the War Assets Administration, chief of metals division; following that was in charge of export division for a short time. He started with the Atkins Co. in November of this year.

• **Emmett M. Goodbar** has been appointed division superintendent of maintenance at the Pittsburg, Calif. plant of Columbia Steel Co. Mr. Goodbar joined Columbia in 1926 as a machinist.

• **V. C. Orange** has been appointed maintenance and service superintendent of Atlas Steels Ltd., Welland, Canada. He joined Atlas Steels in 1941 as superintendent of forging and production machine shops.



**JOHN L. BEARD**, manager, small products division, American Hoist & Derrick Co.

• **John L. Beard** has been promoted to manager of the small products division of American Hoist & Derrick Co., St. Paul. He joined the company in 1945.

• **J. Fred Getz** has been appointed to the position of sales manager of the I-T-E Circuit Breaker Co., Philadelphia. Mr. Getz has been with I-T-E since 1944, serving in the various positions of manager, Washington office; manager, switchgear sales in the home office, and lately, assistant to the president. He had previously been a member of the General Electric Co. for 8 years. From 1943 to 1944 he was sales manager of the Roller-Smith Co. in Bethlehem.

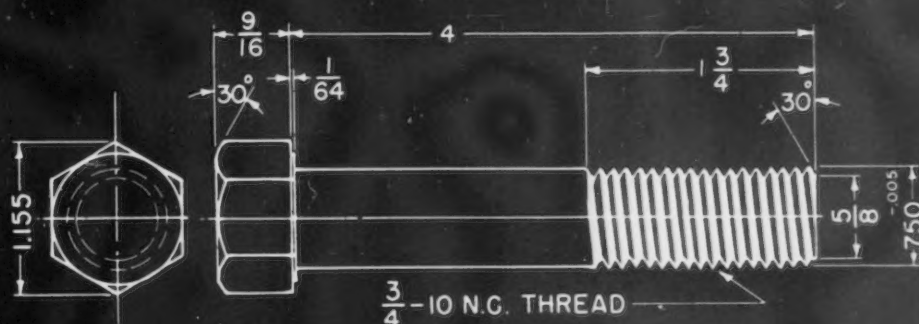
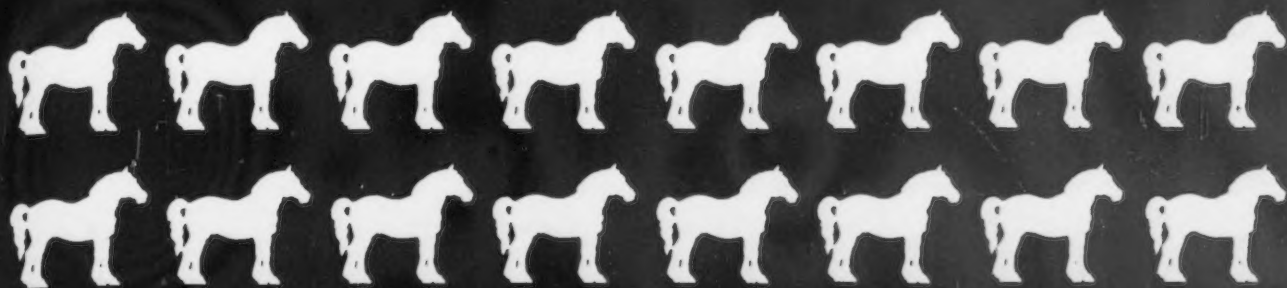
• **Norman P. Robie** has joined the research staff of the Electro Refractories & Alloys Corp., Buffalo, and has been appointed engineer in charge of organic and abrasive research. Formerly with the National Bureau of Standards, he has more recently been senior research engineer in the laboratories of the Carborundum Co.

• **Newton H. Hoyt**, works manager of the Singer Mfg. Co., Bridgeport, Conn., will retire Jan. 1.

• **Frederick C. Crawford** has been elected to the board of directors of the Armstrong Cork Co., Lancaster, Pa. Mr. Crawford is president of Thompson Products, Inc., of Cleveland.

(CONTINUED ON PAGE 100)





HOW  
MUCH

HORSEPOWER are You using?

Here is a typical example of the effective use of carbide cutting tools on a Jones & Lamson No. 3 Universal Ram Type Turret Lathe. The depth of the main turning cut is less than  $\frac{1}{4}$ ". Yet the single carbide turning tool creates a load in excess of 16 horsepower.

Of course, we know this simple, ordinary job would normally be routed to an automatic. But we put it on a Turret Lathe to give you, a practical, simple example of the horsepower required for effective turning with Carbide tools.

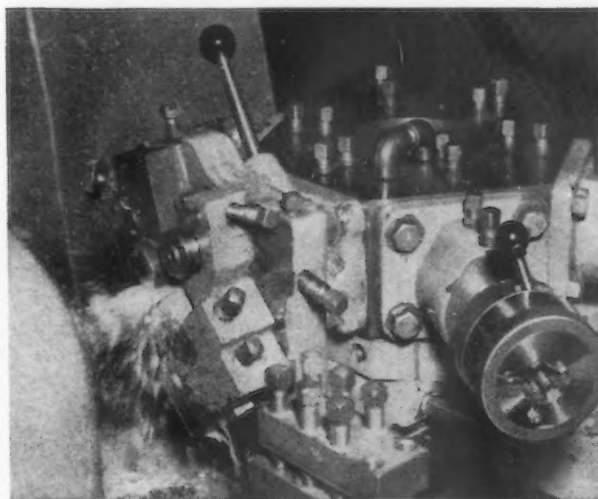
Our folder "One a Minute" describes this operation in detail, and contains vital information for anyone contemplating the purchase of a Turret Lathe, the general use of carbide cutting tools, and greater efficiency in metal turning.

Send for this folder. Or better yet, telephone or write for a Jones & Lamson engineer who will be glad to consult with you on all phases of your metal turning problems.

Jones & Lamson Lathes are designed specifically for the most efficient use of carbide cutting tools.

This  $\frac{3}{4}$  x 4" Cap Screw is machined entirely with carbide cutting tools except for the high speed steel Chasers in the die head. Total time per piece is one minute.

Spindle speed 1500 RPM Feed .033



*Powered for Carbide*



**JONES & LAMSON**

MACHINE COMPANY, Springfield, Vermont, U. S. A.

Manufacturer of *Turret Lathes* and Fay Automatic Lathes  
Automatic Double-End Milling and Centering Machines • Automatic Thread Grinders • Optical  
Comparators • Automatic Opening Threading Dies and Chasers • Ground Thread Flat Rolling Dies

• Congress likely to enact voluntary allocation scheme . . . Administration will go along despite requests for mandatory power . . . Harriman believed to favor voluntary methods . . . Commerce also studies transportation as factor in determining industry location.



WASHINGTON — To allocate or not to allocate is the problem bedeviling the Democratic Administration as well as the Republican Congress. Amidst all the confusion that has surrounded this vital issue one fact stands clear—Congress is not going to enact any mandatory priority and allocation system as proposed by the administration.

However, passage of legislation which will state as a matter of policy that voluntary allocation programs, such as those that have been used for freight cars and certain housing products, are to be encouraged is a reasonably good bet. Such legislation would also carry antitrust exemption for industries participating in voluntary programs under rigidly defined standards. Legislation covering voluntary wage and price agreements will be considered, but is not likely to pass.

While Congressional willingness to sanction a voluntary program of allocations indicates a weakening of the original hostile position of the Republican leaders, it is also an indication that Congress realizes

that the scope of any allocation program can be adequately controlled by means of appropriation bills—regardless of the wording of the enabling legislation.

A program for encouraging voluntary allocations of steel and other materials to a limited number of critical items would be satisfactory to the administration, notwithstanding the pleas of Commerce Secretary Harriman for broad discretionary allocation powers as outlined by President Truman in the anti-inflation message.

There has been considerable doubt in the minds of steel industry leaders concerning Mr. Harriman's position on allocations, despite his repeated statements that steel is one commodity that must be controlled. At their recent off-the-record meeting with Mr. Harriman the steel executives were not able to get a clear cut idea of the secretary's position on the subject. Mr. Harriman now realizes that he made a mistake in not telling the assembled group that, irrespective of his personal views he was obliged as a member of the Cabinet to support the President's program on Capitol Hill.

Speculation as to the secretary's position on this matter has been widespread particularly since his department would be responsible for the administration of an allocation program—voluntary or otherwise—but there has been little concrete evidence to support the theory that Mr. Harriman would much prefer voluntary measures.

LENDING official sanction to this theory for the first time, some of Mr. Harriman's closest advisers told THE IRON AGE that the Dept. of Commerce "would be more than willing to lend its support to a voluntary allocation program covering a limited number of critically short products." They further indicated that if Congress should grant broad authority Commerce would use it primarily as a "weapon to insure the effective operation of voluntary schemes."

Further strengthening this theory

is the fact that the activity within the Commerce Dept. has been such as to clearly indicate that Mr. Harriman is somewhat less than wholeheartedly in favor of broad mandatory allocation powers.

Up to this time, the work within the department has been almost entirely concerned with the legal aspects of the administration effort to straight-jacket the economy, that is, preparation and refinement of legislation to carry out the President's program.

There has not been any concerted effort to gather the large amount of data that would be needed to put into operation an allocation program of any considerable scope. No individual in Commerce is prepared to say how much steel would be allocated under the administration proposals, nor has any study been given to the problem. Outside sources say that as much as 15 pct of the industry's output would be set aside for critical programs, but Commerce officials maintain that this figure is excessive. However, they have no figure of their own to offer in rebuttal.

Personnel to administer an allocation program is another problem to which Commerce has given little attention. The personnel officials within the department are convinced that it would be exceedingly difficult to recruit a competent staff. Commerce has been trying to add two steel industry men to its advisory staff for some time and thus far has had little luck.

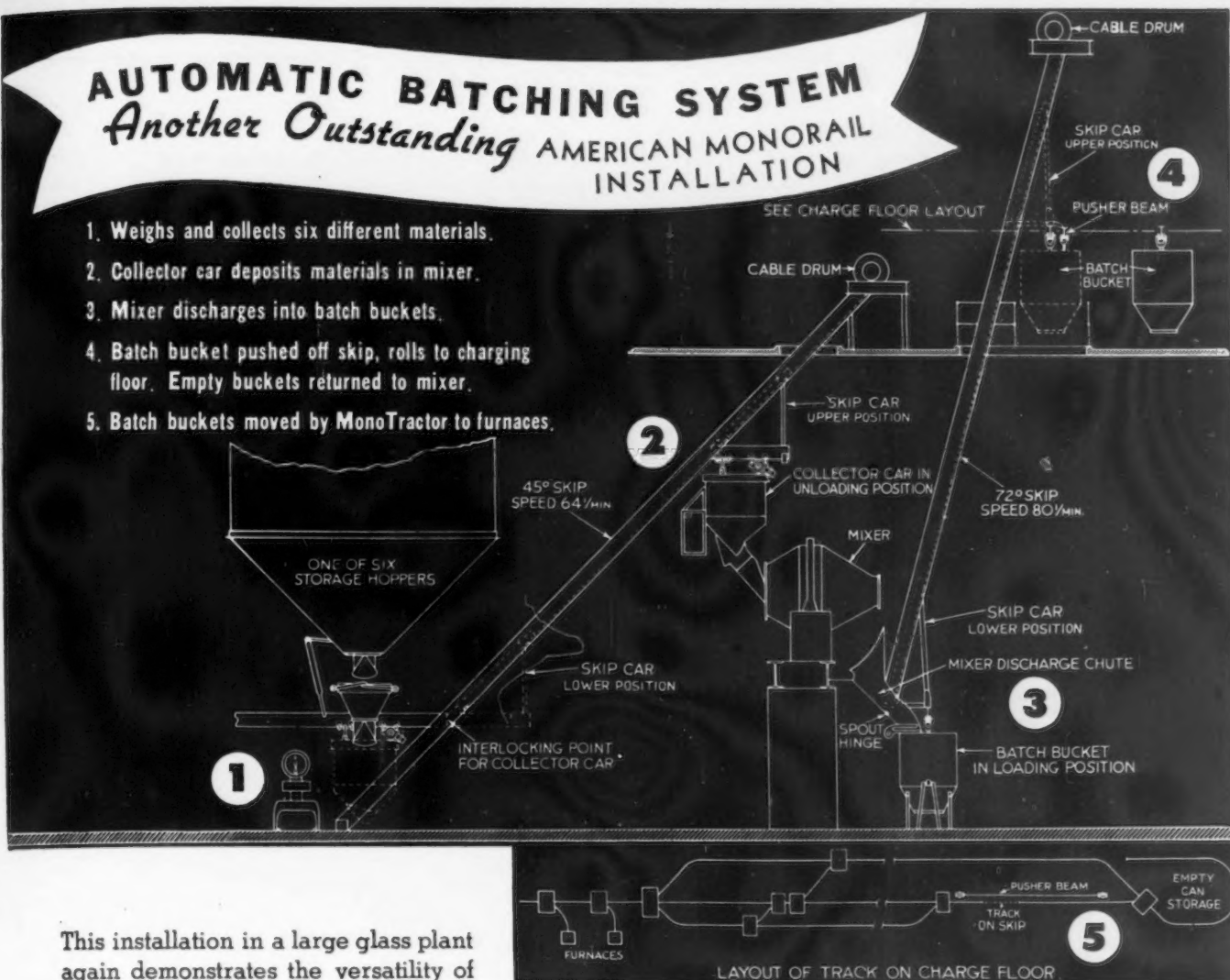
IT IS also realized that statements such as that of Rep. Smith, R., Ohio, who recently was charged with an attempt to impugn the motives of Hiland Batcheller, president of Allegheny-Ludlum Steel Corp., and other industrialists who served on the Harriman Committee will not make their task of personnel recruitment any easier.

Then too, if Mr. Harriman sincerely believed in the necessity for allocations he would be overruling the recommendations of iron and steel experts within his department



# **AUTOMATIC BATCHING SYSTEM** *Another Outstanding* AMERICAN MONORAIL INSTALLATION

1. Weighs and collects six different materials.
2. Collector car deposits materials in mixer.
3. Mixer discharges into batch buckets.
4. Batch bucket pushed off skip, rolls to charging floor. Empty buckets returned to mixer.
5. Batch buckets moved by MonoTractor to furnaces.

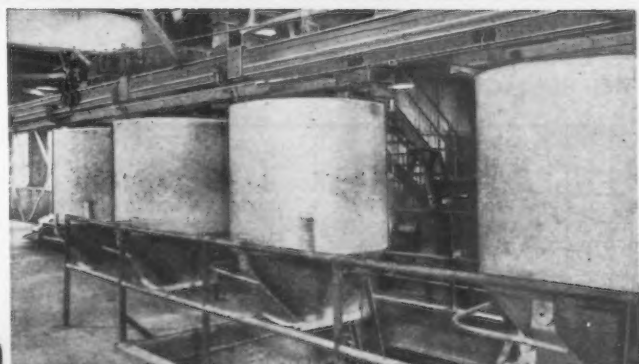
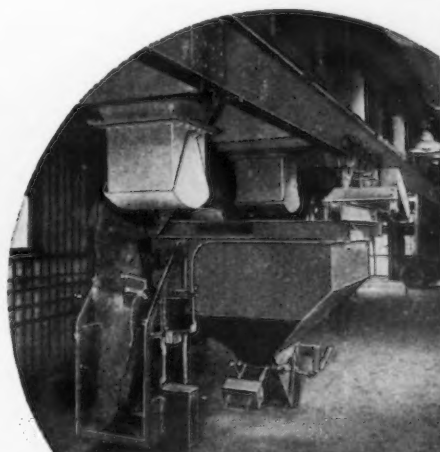


This installation in a large glass plant again demonstrates the versatility of American MonoRail engineering and equipment. Thirty tons of glass batch per hour are measured, mixed and delivered to furnaces by push button control. Let an American MonoRail engineer talk to you about your handling problems. He will show you how to save money and speed up production.

SEND FOR  
BULLETIN C-1



A 56-page book  
showing successful  
applications of  
American Mono-  
Rail Systems.



# **THE AMERICAN MONORAIL COMPANY**

13103 ATHENS AVENUE

CLEVELAND 7, OHIO

THE IRON AGE, December 18, 1947—91

and there has been no indication of any disagreement on the part of the Secretary with the suggestions of these men. In fact, their recommendations have formed the basis of much of the discussion between Commerce officials and the steel industry.

These recommendations include a veto on price controls and allocations on the grounds that their efficacy as an anti-inflation measure is open to serious doubt. It is also pointed out that European aid requirements are not yet stable enough to warrant their institution as an adjunct to the European Recovery Program.

The secretary has also been told that limiting the uses of steel to so-called essential products would save at most 1,500,000 tons of steel and would probably further increase the amount of steel in the gray market.

Actually, Commerce Dept. proposals to the industry in private meetings have run along the lines of methods for invoking accelerated depreciation, subsidies for electric furnaces and other high cost units, subsidies for the return of overseas scrap, government financing for expansion and other such measures—in which the steel industry has yet to take the lead.

THE role of transportation as one of several significant factors determining the location of particular industries is the subject of intensive study in the Transportation Div. of the Office of Domestic Commerce. In response to widespread demand for specific traffic flow data and information on the effect of freight rates and other transportation factors upon the development of particular industries and markets, Commerce has undertaken the preparation of several studies on specific industries.

These studies will include data showing state-to-state, intraregional, and interregional flows of traffic by major commodity groups and will reveal, to the extent possible, the significance of freight rates and services upon the location of particular industries.

The first study, already released, covers transportation factors in the location of the cast iron pipe industry. It was undertaken on an exploratory basis to determine the usefulness of sample state-to-state traffic flow data and point-to-point rate and short-line distance data in an analysis of the problems of industrial location. Other studies now in the planning stage will cover construction items and certain basic commodities.

ALTHOUGH the cast iron pipe industry was selected as the subject of the initial study largely because essential rate and traffic data for that industry were immediately available from waybill sample sources, the geographic concentration of production and widespread markets were also determining factors.

The study points out that while such favorable factors as availability of labor at relatively low wages and an adequate supply of low cost foundry iron should not be minimized as important considerations in attracting the cast iron pipe industry to southern locations, the early establishment of favorable commodity rates on the movement of cast iron pipe and fittings out of the South was prominent among the causes for the development of the industry in this area.

Highlighted as of even greater interest are the "factors which will exert influences upon the future location of the cast iron pipe industry. Although the industry has been concentrated for a long time at southern locations and the economics of production may maintain that concentration, it is of interest to note the factors which may attract new production to other locations. For example, the industrial expansion and population growth which have taken place on the Pacific Coast in recent years have increased the markets for all types of commodities in that area. The West has been a deficit producing area in cast iron pipe and fittings. However, the expanding markets there and the savings in transportation which could be realized from supplying those markets from local production appear to be particularly favorable factors for consideration by those interested in providing additional foundry capacity for producing cast iron pipe and fittings in the West."

Detailed statistical analyses also accompany the study.

## THE BULL OF THE WOODS

BY J. R. WILLIAMS

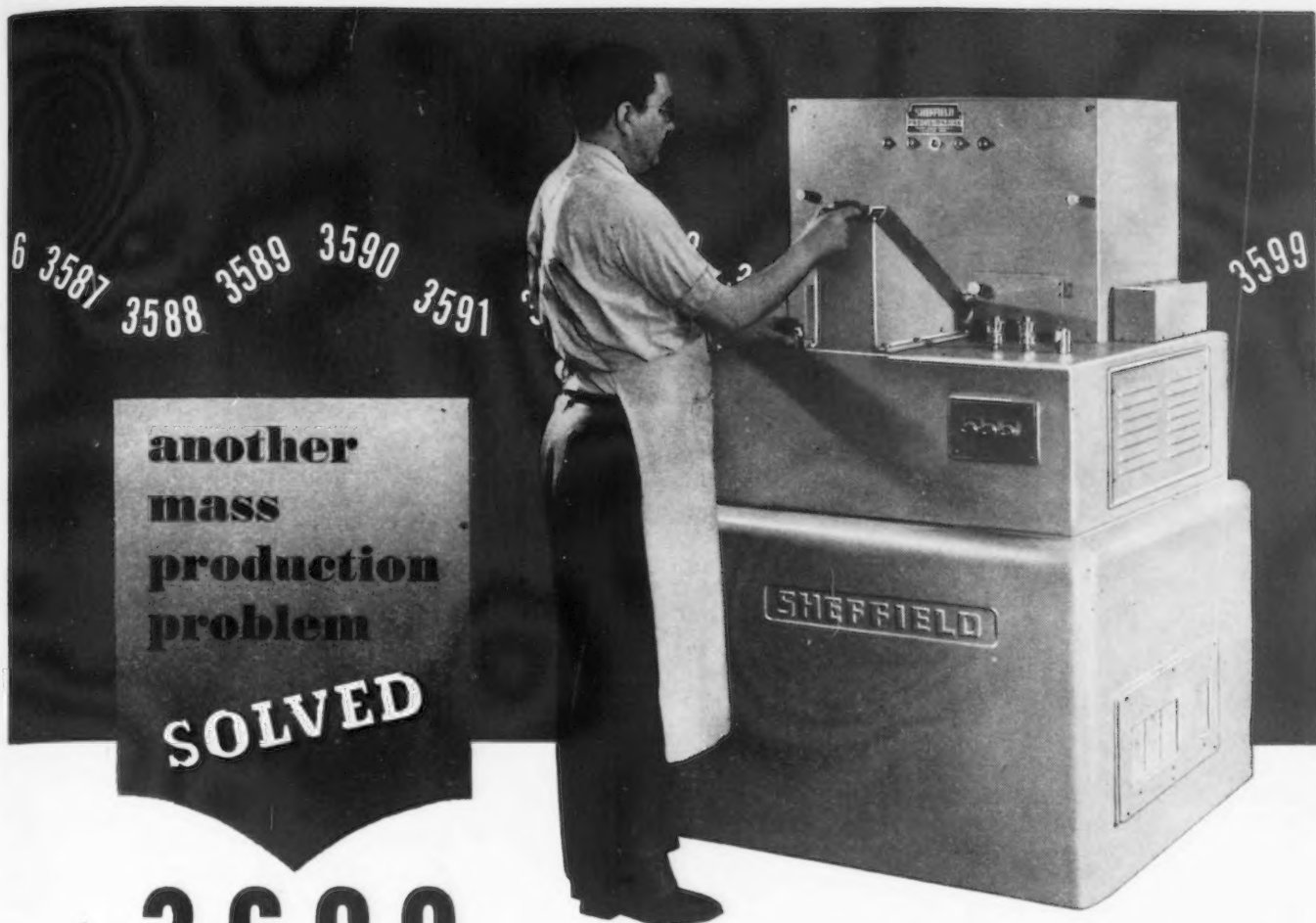


## Seasonal Decrease Felt

Washington

• • • Despite the dropping of 42,500 employees in November, average construction employment for the month was 1,852,000 workers, a drop of 3 pct from the September postwar peak but 8 pct above November 1946.





**another  
mass  
production  
problem**

**SOLVED**

**3600**

***pistons classified per hour***

Shock absorber pistons come by conveyor from the centerless grinders to this Sheffield "Airlectric" Automatic Gaging Machine for inspection and dimensional classification.

The operator merely feeds the pistons into a chute. The "Airlectric" then automatically segregates undersize and oversize units. At the same time, those which fall within toler-

ance limits are separated into five classifications for subsequent selective assembly—and at the rate of 3600 units per hour.

If you require accurate inspection on large volume production, you can make material savings with machines similar to that described here. *Chek with Sheffield* on multiple and automatic gaging problems.



**the *Sheffield* corporation**

**Dayton 1, Ohio**

**U. S. A.**

{ Standard Gages  
Shipped in 24 Hours }



2580

# West Coast . . .

ROBERT T. REINHARDT

• Dean E. T. Grether studies the settling process in West Coast industries' 2 years post-war and suggests the trend toward a growing intraregional economy.



**L**OS ANGELES — From about 1850, when the pioneers and gold seeking adventurers first planted the roots of an elementary economy, until about 1940, when the population of the seven states west of the Rocky Mountains had reached 11½ million, most of these hardy, lusty and self-confident Americans have been pretty much occupied with taking in each other's washing and swapping each other's odd jobs, economically and industrially speaking.

It begins to seem pretty certain now, 2 years after the war pressures have been relieved and the natural future pattern begins to take shape, that the people of this far western area from now on will do much more in making each other's clothes, building and furnishing each other's houses and supplying the tools of each other's industry, transportation and recreation.

Dean E. T. Grether, of the School of Business Administration of the University of California, is an academic economist who is also very close to business and commerce. He has the feel of industry and commands the respect of intelligent business men for his practical and sound contacts. Therefore, his recent address at the annual statewide meeting of

the California State Chamber of Commerce on California's present and future industrial development is both of interest and significance.

"What is the long range outlook? Are there limiting factors?" he asks, and in turn is bold enough to suggest the answers.

To sketch in the background, he points out that between 1899 and 1937, the number of manufacturing wage earners in Calif. increased fourfold and the value of manufactured products 12-fold. So there was steady but unspectacular growth. From 1919 to 1937, manufacturing wage earners increased 40.2 pct in Calif. in contrast with a decrease of 4.8 pct in the country as a whole. Yet California's employment in manufacturing industries just prior to World War II was still somewhat below the national average.

**D**URING the war period, the West Coast manufacturing industries expanded to a much greater extent than in the country as a whole, percentage-wise, chiefly in the production of durable producers' goods. Taking 1940 as an index of 100, employment for these industries rose from 98.2 in 1939 to 425.2 in 1943. Though shipyard and aircraft production have since been cut back heavily, in September 1947, employment in the manufacturing industries as a whole still stood at 160.7 compared with 1940, and payrolls had increased to 322.1 during the same period. Whereas construction and manufacturing absorbed only 21 pct of total employment in 1940, the percentage had increased to 25 in June 1947.

Greatest relative increase in employment since 1940 has been shown in the production of electrical machinery, with 195 pct increase in employment and 521 pct increase in payroll. Other machinery shows 115 pct increase in employment and 285 pct increase in payroll. Iron, steel and their products now employ 63 pct more people and pay 219 pct more wages than 7 years ago. In September 1947, employment in the manufacturing industries as a whole was

60.7 pct above 1940 and payrolls were 222.1 pct increased.

From January 1945 to Nov. 1, 1947, the Los Angeles Chamber of Commerce reported 674 new plants started or announced with a capital investment of \$170 million in Los Angeles County. For the same period, the San Francisco Chamber of Commerce reported 1300 new plants and a capital investment of \$147 million for 12 counties in the San Francisco Bay area. Notice that the southern Calif. plants are about twice as large in terms of capital investment as those in central and northern Calif. For the same period, southern Calif. plant expansions totaled \$182½ million and bay area expansions totaled nearly \$192 million.

"There can be little doubt that Calif. is now entering an era of mature and diversified industrialization," summarizes Dean Grether.

Supporting this thesis, he cites a population growth in the seven western states from slightly under 11½ million in 1940 to over 15½ million in 1947, an increase of 36 pct while the corresponding increase for the United States as a whole was 9 pct. In other words, more than one third of the entire civilian population growth of the country between 1940 and 1947 occurred in the seven far western states.

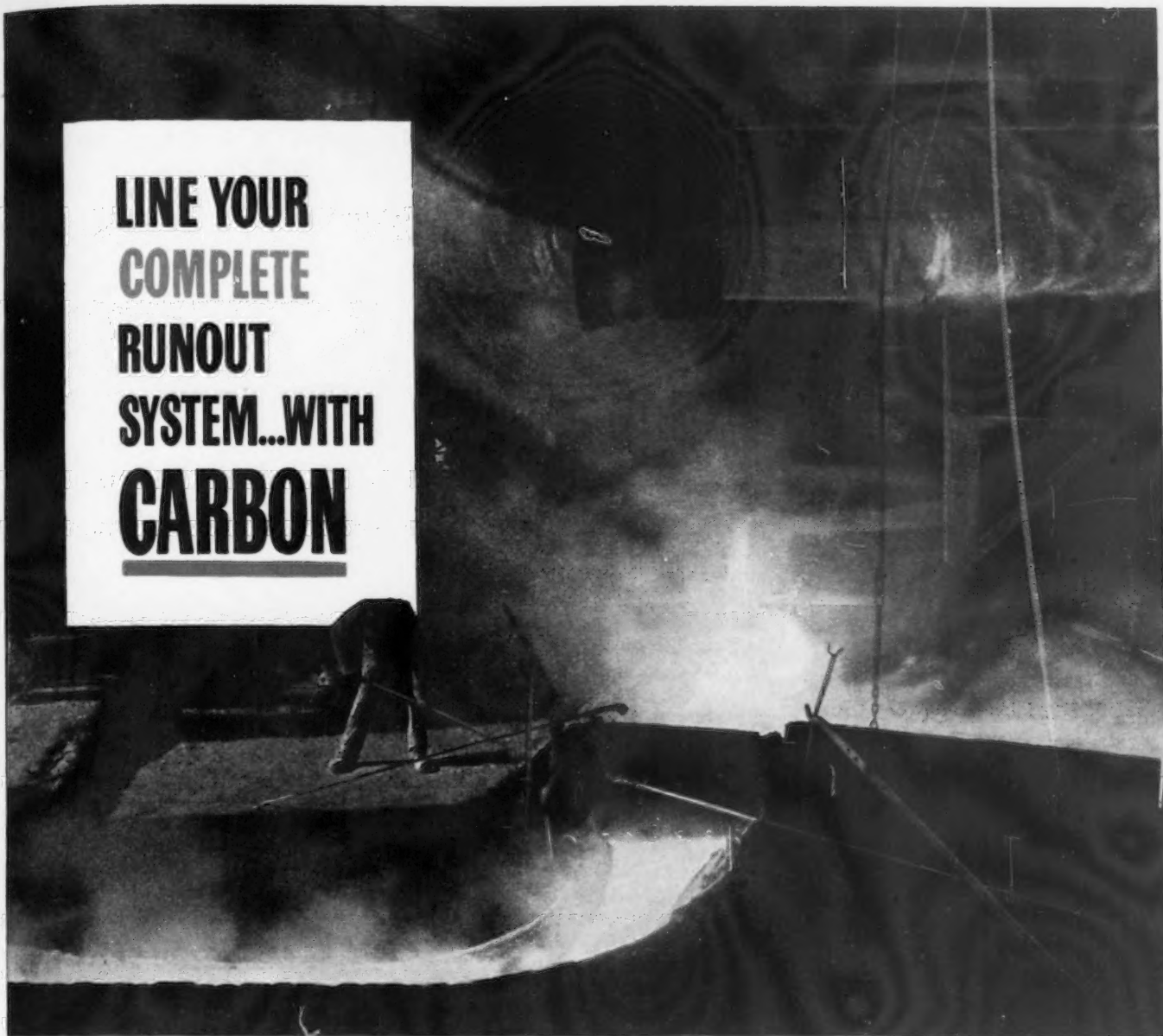
This increase in the size of the regional market permits numerous types of large scale industrial operation formerly uneconomical. With this remarkable population increase has come development of regional sources of primary and fabricated materials, especially in steel and light metals.

"Calif. and the West will be able to meet most staple demands for steel from regional sources within a small number of years," declares Dean Grether.

Other contributing factors are, of course, enlarged supply of labor and skilled workers, narrowed wage rate differentials between the West Coast and the East and Midwest, increased rail and water freight rates and awakening acceptance by national producers of the future importance of the far western separate market, to en-



# LINE YOUR COMPLETE RUNOUT SYSTEM...WITH **CARBON**



● "National" carbon-block linings have for years been doing a fine job in blast furnace runout troughs—between taphole and skimmer plate.

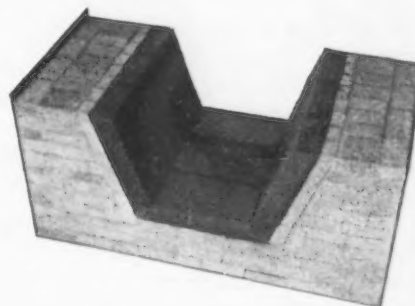
## Why stop there?

Why not use carbon linings for the entire system, from furnace to ladle, and in the lead-in spouts of the pig machine as well? Carbon-block construction, shown at right, is recommended to the skimmer plate. Carbon bricks are most practical for the rest of the troughs.

## Why use carbon?

Carbon outlasts other trough linings by months, even years. It is unaffected by thermal shock. Hot metal will not stick to carbon; so, if any skull is formed in the trough, it is readily removed. Furthermore, if you desulphurize in the trough, you'll find that carbon is highly resistant to desulphurizing agents.

Here is the recommended construction for a carbon-block trough between taphole and skimmer plate. Dark section is carbon. Light section is firebrick.



## NATIONAL CARBON COMPANY, INC.

Unit of Union Carbide and Carbon Corporation  
The term "National" is a registered trade-mark  
of National Carbon Company, Inc.



30 East 42nd Street, New York 17, N. Y.  
Division Sales Offices: Atlanta, Chicago, Dallas,  
Kansas City, New York, Pittsburgh, San Francisco

courage the establishment of branch factories and more independent operation.

**D** EAN Grether suggests that industrialization may be expected to proceed along the following lines:

(1) Continuance of established extractive industries with secure raw materials such as food products, petroleum, lumber and paper.

(2) Expansion of "home market" or "residential" industries that follow population, such as printing, baking, woodmilling, furniture, etc.

(3) Expansion of those industries making unique products for the growing regional market such as, apparel, stoves, ranges, pumps and pumping equipment and other industrial farm equipment. Some of California's strongest export industries now are those which developed unique product qualities to satisfy peculiar regional demands.

Dean Grether points out that in the years ahead the complimentary and supplementary economic relations between Calif. and the other western states will become increasingly complex and important. High freight rates tend to increase intraregional shipments relatively.

Californians will sell a larger proportion and amount of their products in the West and will so import more from other western states. He further suggests that there will be some decentralization of industry within the region, with probable balancing development in central and northern Calif. and in outlying points to parallel the past concentration in the Los Angeles metropolitan area.

**L**IMITING factors to industrial expansion are both absolute and relative. The two absolutes seem to be water supply and fuel supply and cost. Short run difficulties are not serious, but the long run problem in the southern part of the state which includes, so it is estimated, only 1 to 1.5 pct of the state's fresh water supply, is serious. Although the hydroelectric potential is very great, expansion of facilities now involve higher costs. The state is now beginning to import natural gas and fuel oil. All industrial coal must come from Utah or British Columbia.

With the dynamic impetus which war production brought, with the abnormal increase in population, the psychological look towards the West and emphasis on the Pacific, the people and industrialists of the West Coast face, in the next decade or two, the problem of adjusting and readjusting their sights and situations to what appears to be a new era. A lot of physical plants, such as highways, water facilities, irrigation and hydroelectric projects, sewage and industrial waste disposal systems, must be reworked. Growing pains and bursting at the seams take constant treating.

Moreover, a very great deal depends, according to Dean Grether, upon the "organizational and promotional ability of western enterprisers in the perspective of sound, and thorough market analysis, as well as favorable economic factors." Costs and selling ability will be most important in determining the competitive outcome of these industries. Expansion of western operations is not inevitable. Much depends upon the operators.

### **Rod and Cable Plant To Be Built by Alcoa In Vancouver Vicinity**

*Vancouver*

• • • Approximately 600 men will be employed at the aluminum rod, wire and electrical transmission cable plant announced for construction near here by the Aluminum Co. of America. A definite plant site has not as yet been announced, but it is believed it will be in this immediate vicinity near the smelting works of the company.

It is planned to utilize some of the present equipment owned by Alcoa which will be moved to this area from other plants. Some additional new equipment will be purchased.

C. S. Thayer, works manager of Alcoa's Vancouver smelting plant, stated that the new development would be an important step toward realization of the Pacific Northwest's desire that its aluminum industry be expanded.

Steel wire of the kind used for reinforcing the aluminum cable is not now produced on the Pacific Coast, but it is possible that with

**S**ALT LAKE CITY — Mining pays the highest average wage of any industry in Utah, but operators of nonferrous metal underground workings are still having trouble attracting workmen into the mines.

A study by the state employment security division shows that the average pay in the mining industry for 1946 was \$244 per month, \$13 above the 1945 average. All industries paid an average of \$179, contract construction \$205, manufacturing \$188, and transportation utilities \$193.

\* \* \*

James O. Gallagher, Seattle, president of Columbia Metals Co., is still trying to get the war surplus Kalumite plant in Salt Lake City for a bid \$117,000 under the \$752,000 offer of the American Potash & Chemical Corp., N. Y. Utah congressional representatives, the governor and civic groups are backing the high bidder, and the real property board of WAA has recommended acceptance of American Potash's bid.

this large consumer expecting to get into production within the next year such development may follow.

On the heels of Alcoa's announcement came that from the Permanente Metals Corp. which operates the aluminum rolling mill at Trentwood and the reduction plant at Mead, to the effect that this organization also had been discussing the possibility of building a plant for the production of aluminum bar, rod and wire.

Officials of the Henry J. Kaiser controlled company were in Pittsburgh last week to determine the availability of machinery for the proposed plant. It is reported that the operation would be located immediately adjacent to the Trentwood rolling mills.

Permanente is sending four company officials to Europe to supervise the dismantling and shipping of the aluminum foil plant on which it was recently announced as the successful bidder. Fred Drewes and Gustave Lowe, administrative and traffic managers at the home office in Oakland, and John Meek and William Laut, works manager and maintenance superintendent respectively of the Trentwood rolling mills, are making the trip.



# Firefighter With a Reach . . .

## THANKS TO THIS TUBING IDEA

This fire ladder can zip 100 feet straight up in 40 seconds flat—yet, despite its length and light weight, it will bear a one ton load.

Note how steel tubing makes this possible—how the strong, light, square tubular sections are truss-welded into a rigid platform for handling high pressure hose. Even the ladder rungs are tubing.

Although mechanical tubing is widely used to save "machining the hole", it is just as useful in structural applications to save dead weight. It has the added advantage of being easily available — Frasse stocks mechanical tubing alone in hundreds of sizes, in round and square sections, and in carbon, alloy and stainless steel analyses.

It can pay you—in product improvement, cost of production, *often in cost of material*—to think of tubing in your product. And when you think of steel tubing, think of Frasse. Peter A. Frasse and Co., Inc., 17 Grand Street, New York 13, N. Y. (Walker 5-2200) • 3911 Wissahickon Avenue, Philadelphia 29, Pa. (Baldwin 9-9900) • 50 Exchange Street, Buffalo 3, N. Y. (Washington 2000) • Jersey City • Syracuse • Hartford • Rochester • Baltimore

## Want to know more about STEEL TUBING?

"Properties of Pipe and Tubing" is a 150 page handbook of mechanical properties of pipe and tubing. The manual covers external and internal properties, safety factors, allowable working stresses, torsional strength and similar useful data. Send the coupon for your free copy today.

Peter A. Frasse and Co., Inc.

81-1A

(Use nearest address above)

Please send me a free copy of your book  
"Properties of Pipe and Tubing".

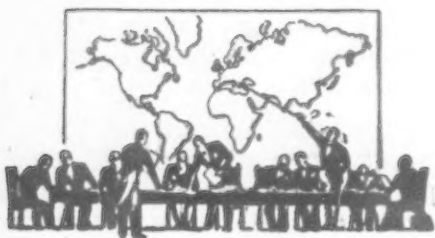
Name.....

Firm.....

Address.....

# European Letter . . .

• Parliamentary democracy in France will have hard fight for survival . . . Communist Party mocks conditions for any democratic system . . . Instigating of strikes has been purely political in character.



LONDON—After recent events it is obvious that parliamentary democracy in France will have a hard fight for its life. Any democratic system must be able to rely, as a minimum, on three things—on a certain underlying conformity of aim among the various social classes; on respect for parliamentary procedure and hence willingness to accept the vote in parliament as the ultimate arbiter of disputes; and on an equal willingness not to carry unsolved disputes out to the violent arbitration of the streets. In France at present, the largest political party—the Communist Party—flouts each of these three preconditions.

It may be that if the other parties had shown more restraint, the excesses of the Communists could have been checked, but of their intention to reduce the Assembly to an impotent “talking shop”—worse, a singing shop—there can be no doubt. And the total disorganization of parliamentary procedure within the Chamber has been accompanied by the fomenting of strikes which, however genuine the economic grievances they exploited, have been purely political in character, designed to bring down the government and reduce the French economy to a state in which it is unfit to participate in the Marshall Plan.

Must the conclusion therefore be that we are witnessing 1922

and 1932 all over again? Is Schuman the Bruening of one more collapsing parliament? Is it only a short step now to the taking over of the French Republic by extremists of the Right who will be ready to crush working-class opposition, sweep away democratic institutions and provide—though at what cost—the authority without which the violent conflicts of French society must tear the community to pieces?

No one would risk the prophecy today that the passing of power to the Right, in the person of General de Gaulle, is either impossible or unlikely. But it is perhaps still possible to say that it is not absolutely certain. The Communists seem to have shot their bolt. In the pattern of strikes in the last weeks, the Communists’ first hope

*Reprinted from The London Economist by special permission.—Ed.*

was that if they could foment local strikes on the wage issue, the example would prove contagious and nationwide strikes in various branches of industry would become general. The technique was more or less successful in the coal fields and the steel industry but failed when the railwaymen did not follow the local strikers’ lead. The Communist-dominated CGT then called a general railway strike and set up a National Strike Committee.

A wave of political strikes designed to paralyze the country’s administration must either be successful or else its sponsors are left worse off than they were, with their bluff called and their weapon broken. The dynamics of the French situation may therefore turn against the Communists now that a great mass of workers is beginning to show a willingness to stay at work.

IT is above all the fact that economic assistance—possibly on a massive scale—is on the way that distinguishes France today from the hopeless Germany of 1932. No moderate government can survive the degree of economic maladjustment prevalent in France today.

But it is just possible that it may not be asked to do so. The present wave of strikes, which have genuine economic roots, should not be allowed to mask the fact that between whiles the French have been working hard and well, with industrial production in October well above the level of 1938 in key sectors such as coal, steel, electricity, building materials, and a number of heavy industries.

In production at least—distribution is another matter—France is suffering more from the maladjustment of the world economy than from any lack of effort on its own part. Hence there is hope that the Marshall Plan, by ending some of these maladjustments, will allow French production to reap its reward in better distribution, in rational prices and restored finances.

But to seize these chances of saving the Republic, M. Schuman’s government, or any other coalition which may succeed him, must face an incredibly delicate and difficult winter.

The aim of any moderate government now should be to foster and strengthen at all cost the growing moderate wing of the CGT, to be scrupulous in its defense of the legitimate rights of the workers, and to seek a *ralliement* of all trade unionists who are sick and tired of Communist excesses, but rightly suspicious of a strike-breaking government.

THE second difficulty facing any moderate government is the reality of the workers’ grievances. The misery in the great cities of France has now reached such a pitch that even without Communist fomentation a strike wave would have been inevitable. The root of the evil is food prices and the black market. A revision of wage rates is inevitable and it would almost certainly be the course of wisdom on the part of the government, in its negotiations with the CGT, to concede—to M. Jouhaux if possible—the immediate increase of the minimum wage from 7000 to 10,800 francs a month and to recognize that if further startling ad-

(CONTINUED ON PAGE 112)





## Instrument Cases . . . Close Tolerances . . . Presteel Has the Experience

As producers of precision stampings we have made many large, small and medium-size instrument cases to exacting tolerances—effecting substantial economies for our customers. Illustrated are two of them.

Added advantages of Presteel Instrument Cases are . . . lighter weight . . . greater strength . . . fewer finishing operations . . . improved appearance.

Do you consider these features important? — Visit us at Worcester or contact our representative nearest you.

**WORCESTER PRESSED STEEL CO.**

ALLOY STEELS AND OTHER METALS COLD FASHIONED SINCE 1883

412 BARBER AVENUE, WORCESTER 6, MASS.

Representatives in Alexandria Virginia, Buffalo, Canton Ohio, Chicago, Denver, Detroit, Fort Worth, Indianapolis, Los Angeles, New York, Philadelphia, Syracuse, Toronto

# PERSONALS

(CONTINUED FROM PAGE 88)

• **Louis D. Alpert** has been named assistant to the Pacific Coast general manager; **John S. Selfridge, Jr.** has been promoted to superintendent of the San Francisco plant; and **Robert C. Caldwell** has been promoted to assistant superintendent of the same plant of the Federated Metals Div., American Smelting & Refining Co. Mr. Alpert has been with Federated Metals Div. since 1935, at which time he joined the research department of the company at Perth Amboy, N. J. He was appointed superintendent of the San Francisco plant in 1942 and has held that position until his present promotion. Mr. Selfridge has been with Federated Metals since 1940, first as assistant metallurgist at San Francisco and then as assistant superintendent of that plant until his present promotion to superintendent. Mr. Caldwell was foreman at the company's San Francisco plant until 1941. He was general foreman in charge of the brass ingot department beginning 1944, which position he held until his present promotion.

• **I. W. Preetorius**, who has been associated with General Box Co., Chicago, since its organization, will retire as vice-president and general traffic manager, Dec. 31. **Nels E. Wikstrom**, who has been assistant to Mr. Preetorius for the past 7 years, will succeed him as general traffic manager.

• **William J. Hennessy** has been appointed Pittsburgh district sales manager for the special chemicals division of the Pennsylvania Salt Mfg. Co., Philadelphia. He joined Pennsalt in 1935. After several years' experience in manufacturing operations at the Greenwich plant in Philadelphia, he joined the special chemicals division as a salesman in 1939.

• **J. Shiers Jones**, formerly in the Greensboro, N. C., office of Truscon Steel Co., has been named manager of the company's Birmingham office. Mr. Jones succeeds **Robert B. Smith**, who has resigned to become associated with the Contractors Material Co., Jackson, Miss.



**ROBERT L. DEVITT**, manager, New York office, Simmons Machine Tool Corp.

• **Robert L. Devitt** has been appointed manager of the New York office of the Simmons Machine Tool Corp., of Albany. Mr. Devitt was formerly production manager of the company. He succeeds **William Werley**, who will handle sales in southern territories.

• **Augustus Vogel, Jr.** has been appointed area manager for the industrial areas represented by Michigan, Indiana, Ohio, Kentucky and western Pennsylvania for Nicholson File Co., Providence, effective Jan. 1. Prior to joining Nicholson in 1941, Mr. Vogel had been secretary of the Imperial Paint Co. of Brooklyn.

• **Gordon P. Lovell** has been promoted to the position of assistant to the general sales manager of International Business Machines Corp., New York. He was previously a district sales manager, and is succeeded by **McLain B. Smith**, previously electric accounting machine manager in Philadelphia.

• **Jack P. Thompson** has been appointed district manager for northern Indiana and the southern tip of Michigan by Chicago Steel Service Co. and will make his headquarters in South Bend, Ind. In this territory he succeeds **Walter N. Colbath**, district manager for southern Indiana, who now concentrates his efforts in the Indianapolis area.

• **C. C. Walker** has been elected a commercial vice-president of the General Electric Co., effective Jan. 1. Mr. Walker will assume responsibility for customer relations in the New England territory, with headquarters in Boston, and he succeeds **T. S. Knight**, General Electric commercial vice-president, who will retire Dec. 31 after 44 years of service with the company. Since 1938, Mr. Walker has been manager of the New England sales district of the GE lamp department.

• **Robert E. Forrester** has joined the engineering department of the Parker Appliance Co., Cleveland. He has been connected in engineering capacities at Langley Field NACA laboratories, Fisher Body Div. of General Motors Corp. and Koehler Aircraft Products Co.

• **Thomas H. Pipkin** has been appointed special sales representative on commercial nonaviation products for Texas Engineering & Mfg. Co., Dallas. Mr. Pipkin leaves the Dearborn Stove Co., with which he has been associated as sales representative and development engineer.

• **M. D. Eisele**, a veteran of many Henry J. Kaiser projects, has been appointed to head the Chicago district sales office of Permanente Products Co. He replaces **C. S. French**, who will serve as district sales manager of the Cleveland office. Mr. Eisele moves to Chicago from the Oakland, Calif., offices, where he was product specialist for Kaiser Aluminum building materials. He was formerly general superintendent and assistant general manager of the Owens Lake soda ash plant of the Permanente Metals Corp.

• **Arthur E. Wood** has been appointed to a newly-created position of merchandise manager, freezers, Crosley Div., the Avco Mfg. Corp., Cincinnati. Mr. Wood, a veteran of 16 years with Crosley, has seen service in the engineering, production, and inspection of both radio and refrigeration and more recently has been regional service manager, technical supervisor and supervisor of service part sales.



• **Jack Brand**, formerly assistant sales manager for Thermoid Co.'s automotive replacement division at Trenton, N. J., has been appointed to handle industrial sales for the state of Colorado, with headquarters at Denver. **J. J. Chamberlain**, formerly associated with Pioneer Rubber Mills of California and the rubber division of Paramount Mfg. Co., now handles industrial sales in the state of Washington and the northern half of Oregon, with headquarters in Seattle. **E. J. Dunlap** has been transferred from Trenton, where he headed industrial sales promotion, to San Francisco, where he will have charge of industrial sales for the northern half of California and southern Oregon. **A. Fred Matheis**, who has been in industrial sales with Thermoid at Trenton headquarters for 20 years, assumes the duties of industrial sales promotion manager. **H. William Overman**, manager industrial friction materials division, has transferred his headquarters to the Thermoid office at Detroit, where he continues to direct industrial friction material sales from that office. **Jack Wright**, who will headquarter at Salt Lake City, has been assigned industrial and oil field sales in Utah, Idaho, Wyoming, Montana and Western Canada.

• **Arthur B. Morse** has been named a vice-president and assistant director of sales of the Laclede-Christy Clay Products Co. of St. Louis. Mr. Morse began his career with the Dee Engineering Co., later moving to the Vitrefrax Corp. For the next 14 years he was associated with the Stockton Fire Brick Co. and with its successor, Gladding, McBean & Co., for the 4 years prior to joining the Laclede-Christy organization.

• **F. W. Hainer**, vice-president of Cleaver-Brooks Co., Milwaukee, has been elected to the board of directors and appointed general sales manager. **Edward Kovic**, who has been in the firm's secretarial office, has been named secretary.

• **Edwin J. Keyes** has assumed duties as assistant works manager of the Heald Machine Co., Worcester, Mass. Previously he was works manager of the Reed-Prentice Corp. for 10 years.



WALTER C. ROBERTSON, vice-president of export, Gar Wood Industries, Inc.

• **Walter C. Robertson** has been appointed vice-president of export, Gar Wood Industries, Inc., Wayne, Mich. Mr. Robertson has been with the company for 21 years, and for the past 11 years has been vice-president in charge of national accounts.

• **William F. Bell** has been appointed director and vice-president in charge of production and engineering of Southern Electric, Inc., Hammond, Ind. For 11 years Mr. Bell was engaged as coordinating engineer in the transportation department of the Westinghouse Electric Corp. In 1936 he was appointed superintendent of the transmission department and later promoted to assistant factory manager of the Electro-Motive Div. of General Motors Corp.

• **W. E. Day** has been appointed director of research for Mack Trucks, Inc., New York. In assuming his new duties Mr. Day relinquishes the post of chief metallurgist for Mack, as well as that of general foundry superintendent.

• **Bernard F. Anderson** has been named general manager of the Elmira, N. Y., plant of Remington Rand, Inc. He formerly was production manager of the company's systems division plants.

• **Mark R. Dull, Jr.**, for the last 2 years managing director of Willys-Overland de Mexico, Willys-Overland's Mexican operation, has been appointed assistant general manager of Willys-Overland Export Corp., Toledo.

• **W. S. Kendrick**, who has been General Electric X-Ray Corp.'s vice-president in charge of sales for 25 years, has joined the president's staff in Chicago, where he will handle special assignments. He has been in the General Electric organization for 40 years. While with the parent company, Mr. Kendrick for several years headed the special products department. **John H. Smith**, who came to the firm recently as assistant to president John H. Clough, has been named vice-president in charge of the newly-created marketing division.

• **G. S. Platt** has been made assistant to the president of the Indian Motorcycle Co., Springfield, Mass., in charge of factory-dealer relations. He had been Simplex Mfg. Corp. director of sales, and prior to the war, sales manager for Packard Motor Car Co.

## OBITUARY...

• **Hugh J. Dowd, Jr.**, 60, personnel manager of the Niagara Falls Smelting & Refining Corp., Buffalo, died Dec. 1.

• **George Waite**, 65, one of the founders and former president of the Irving Air Chute Co., Buffalo, died Dec. 1.

• **J. T. Ryerson, Sr.**, 67, retired president of Joseph T. Ryerson & Son, Inc., died Dec. 7. Mr. Ryerson was also a director of Inland Steel Co. and Belden Mfg. Co.

• **Kenneth A. Bruner**, 36, vice-president and sales manager of the Bruner Corp., Milwaukee, died Dec. 1.

• **Harrison S. Robinson**, 70, died Nov. 29. Mr. Robinson was an officer of several San Francisco Bay area business concerns including United Engineering Co. and Coast Mfg. & Supply Co.

# Industrial News Summary...

- Drive Now on for Allocations
- May Be Too Much for Congress
- Scrap Market Testing to Come

**A**DMINISTRATION leaders and others who have suddenly begun plugging for legislative allocation controls in the steel industry either are unfamiliar with current steel market conditions or are willingly fostering propaganda in order to bring about such allocations.

With few exceptions the tight steel supply, the current gray market and the condition of the raw material picture are no different than they have been for months on end. Nor will the carrying out of the Marshall Plan, as far as steel is concerned, create any tighter situation than has already been brought about by urgent steel exports during all of this year.

Hundreds of steel users are still finding it difficult to obtain as much steel as they think is necessary to maintain schedules to meet demand for manufactured products. Most of these companies, however, on an actual tonnage basis are getting somewhat more steel than they were a year ago. Because of continuing demand, it may be many months before steel supplies will even remotely catch up with total steel requirements.

Past experience has shown that the imposition of allocations over only a part of steel distribution has made itself felt throughout the entire picture. According to information obtained by THE IRON AGE, consumers who are seriously short of material do not favor an imposed allocation control plan. They recall that earlier this year the purely voluntary freight car program under which the steel industry agreed to specific allotments made itself felt among all other types of steel users. In many cases the latter's steel supplies were pared down so that the car program could be served.

**T**HE spectre of steel allocations has been pushed into the background temporarily but it could easily be revived. If the Administration succeeds in its 15,000 car a month program there might be a demand from Washington for legislative allocation of steel to meet it. Despite shipment of sufficient steel to meet the 10,000 car a month program the goal was not reached in 6 months of effort.

Unless the steel industry and its leaders put up a stronger personal appeal or defense for the current record breaking output of steel production it may wake up to find that the pressure for an industrial straight jacket has been too much for Congress. A few leaders have spoken out frankly and have made it plain that within the framework of voluntary distribution major essential steel users have been taken care of as much as possible.

The current dither about the gray market in steel has expanded all out of proportion to the size of such a market. This has come about because steel quotas for many customers were slashed to the bone in November and December as mills were unable to meet previous promises. This they could not do because of a coal strike last summer and because of a major

labor tieup on a strategic industrial tieline railroad in the Pittsburgh district several months ago.

There is little that the steel industry can do to alleviate the plight of steel users any more than has already been done. For that reason there is not a chance that output will be great enough for many a month to silence the insistent demand for some kind of "action." The only possible answer during the first 6 months of 1948 is the maintaining of the present high ingot rate—a feat which will depend on the weather, scrap market and availability of pig iron. Raw materials for steelmaking have been tighter than a drum all year, yet the industry, for the past 4 weeks has reached an all-time high for a peace period.

**T**HE cold war between scrap suppliers and scrap consumers has produced no major casualties on either side. Quotations on scrap have been forced down by lack of large scale buying which must be resumed soon if steelmakers' inventories of scrap are not to melt away completely. The major test of present scrap prices is still to come.

THE IRON AGE heavy melting steel scrap composite price went down 50 cents a gross ton this week and now stands at \$39.75 a gross ton. This continues a gradual decline over the past 7 weeks from the record level of \$42.58 a gross ton reached during the week of Oct. 30. There were no changes in the price of No. 1 heavy melting steel at Pittsburgh and Chicago this week but the average price of this grade fell off \$1.50 a ton in Philadelphia, thus placing that market more in line with the other two.

A last minute check indicates there is no letdown in demand for steel by manufacturers of stoves, refrigerators or household appliances. If anything the pressure may be slightly more severe from some quarters. Many of these concerns have been forced to pick up steel on the gray market in order to keep up schedules set up earlier this year. But in other cases there has been a large movement towards the use of aluminum sheets where there appeared to be no chance to obtain additional steel.

This changeover to aluminum by some makers has so cluttered up the order books for aluminum sheets that producers find themselves in a situation similar to the steel industry. One large firm handling heating equipment is now using aluminum for all of its duct work. The same firm is considering the use of the same metal for fuel oil tanks after being unable to locate steel sources. It may be that steel makers will have a hard time wooing such customers back into the fold if they are left with their new substitutes for a very long period.

The steel ingot rate this week continues at 98 pct of rated capacity. On an annual basis this about matches any previous record and, if continued, will be a new bogey to be superseded in the coming year. Some steel firms may lose production over the Christmas week, reducing the rate a few points.



• **NAIL GRAY MARKET**—Nail producers have been requested to meet in Washington on Dec. 17 with Sen. Ralph E. Flanders, R., of Vt., to discuss ways and means of combatting the gray market in nails. Senator Flanders, chairman of the Joint Congressional subcommittee on High Cost of Housing, charged that not only were gray markets asking prices three and four times the normal market price but that some dealers were offering to deliver amounts equal to two thirds the national monthly output. His committee had uncovered evidence that nails were being offered for sale by such outlets as women's wear stores and chicken hatcheries. In telegrams to 26 leading nail manufacturers requesting the meeting, Mr. Flanders said there was no evidence that manufacturers were profiting from the gray market. But, he added, unless the gray market is broken the only alternative was government control. He said that while gray market nails did not add significantly to the cost of housing, their lack resulted infinitely to delays in construction.

• **TARIFF PROBLEM**—One of the critical problems in Canada is the question of United States tariffs. The Howe program contemplates in the long run a new trade deal with the U. S. which will give substantial concessions to industries which can compete with American manufacturers, particularly in the branch plant field. Exploratory feelers, it is understood, already have been put out at Washington, and there appears to be some hope that the contemplated tariff negotiations will be successful.

• **GERMAN STEEL PRODUCTION**—German steel production has been set at 11½ million tons annually, as a result of an agreement by the Council of Foreign Ministers in London. This, of course, is a future target, since the present annual production is slightly under 3 million tons. Under the terms of the agreement, Germany is to be allowed to develop "sufficient capacity to produce" the maximum set by the ministers.

• **TO LEASE MILL FOR SHEETS**—Hudson Motor Car Co. is ready to lease from WAA part of a plant at New Castle, Pa., to make 84,000 tons of semi-deep drawing sheets for interior and frames annually. Once the Shenango tin

mill of Carnegie-Illinois, it was sold before the war to DPC and later run by Alcoa as an aluminum forging facility. Hudson will have two lines in operation, with jump mills and finishing stands plus two cold mills.

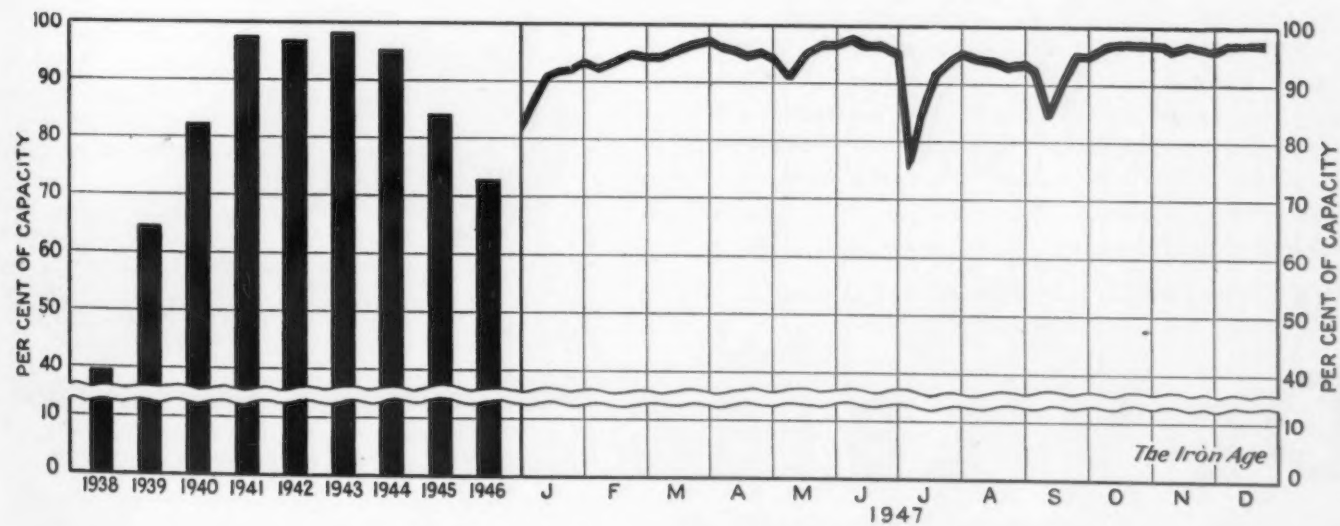
• **AISI GRANTED MORE TIME**—The American Iron & Steel Institute and the 101 steel producers named in the Federal Trade Commission's suit against the industry have been granted an extension to Dec. 19 to answer FTC's charges. Another 20-day extension probably will be granted by the commission, extending the deadline to Jan. 8. The amended complaint against AISI and the industry charges conspiracy to hold down capacity, in addition to the previous charge of price-fixing.

• **PEACETIME PRODUCTION RECORD**—Steel production during November totaled 7,249,523 net tons of ingots and steel for castings, bringing the total for the first 11 months of this year to 77,434,423 net tons, according to the American Iron & Steel Institute. This was about 25 million more tons of steel than were produced in the entire prewar year of 1939, and almost 11 million tons above the total output in 1946. The November figure is also the highest ever attained during that month in peacetime.

• **DEADLINE SET**—At the Council of Foreign Ministers meeting in London it was agreed that a "final list of plant and equipment to be removed from Germany shall be issued by the Control Council not later than Apr. 15, 1948." It was also decided that liquidation of war plants should be completed by June 30, 1948.

• **JACKPOT AT J & L**—Jones & Laughlin salaried employees are getting a "special compensation payment" this year. Though paid at Christmas time it's not called a bonus. Exempt employees get 50 pct of a month's pay; nonexempt get 25 pct, with \$500 the top payment. Production workers are getting about \$8 million in retroactive pay in settlement of wage inequities.

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
December 9 . . .	104.0	96.0	92.5	93.5	95.5	102.0	100.0	102.0	103.5*	110.0	100.0	96.0	98.0	98.0
December 16 . . .	105.0	94.5	93.0	93.5	95.0	102.0	101.0	102.0	101.0	111.5	100.0	96.0	108.0	98.0

\* Revised.

*For the Finest Finishes*

ON ALL SURFACES WITH  
ANY COATING MATERIAL

**There's a DEVILBISS**

**AIR CAP and FLUID TIP**

*exactly suited to the job!*

Although normal finishing operations generally require only a limited number of air caps and fluid tips, the problem of applying special materials quite frequently arises. When such a situation occurs, DeVilbiss has a ready solution in a comprehensive selection of scientifically engineered caps, tips and needles. Practically every known finishing material has been analyzed in the DeVilbiss Technical Laboratory and the most efficient and practical combination for applying each type of material has been determined by actual test. Extra service such as this is your assurance of having the right cap and tip when using DeVilbiss equipment whatever the spray material may be.

Whether you're finishing with lacquers . . . whether you're spraying synthetics . . . whether you're coating automatically . . . whether you're doing touch-up, shading or blending work . . . whether you're using suction or pressure material feed . . . DeVilbiss research has perfected equipment for your particular problem. If you need a ten-inch pattern with feathered ends for over-lapping flat surfaces . . . if you need a four-inch pattern with blunt ends for spraying narrow objects . . . or whatever your problem, DeVilbiss has the economical and practical solution.

**THE DEVILBISS COMPANY • Toledo 1, Ohio**  
Canadian Plant: WINDSOR, ONTARIO

**DEVILBISS**

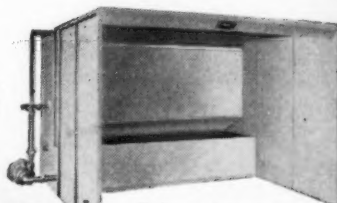


**A COMPLETE DEVILBISS LINE**

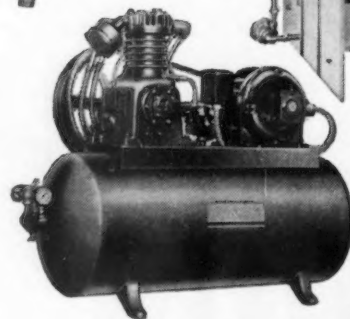
**TO SOLVE THE EXACTING  
FINISHING PROBLEMS OF  
ALL INDUSTRY . . . . .**



Spray  
Equipment for  
every finishing  
requirement.



Exhaust Systems  
of various  
types and sizes.



Air-cooled  
Compressors and  
Tank Mounted  
Outfits.

Air Hose, Fluid Hose,  
and Connections for  
long useful service.



*means Quality in all four..*

**SPRAY EQUIPMENT  
EXHAUST SYSTEMS  
AIR COMPRESSORS  
HOSE & CONNECTIONS**



## Special Report . . .

## Steel Industry Not Earning Enough, Expanding Too Much

## New York

••• A year-end review of the steel industry should not be issued without at least one Wall St. opinion. After all Wall St. built up the steel industry by selling its shares to investors, or, as some people say, to the public, and every now and then Wall St.'s opinion counts again when some steel company needs additional funds for expansion. So maybe there is something for non-Wall Streeters to gain in learning how Wall St. looks at an industry.

Most of us in Wall St. are perennial bulls, and therefore, we do not care what industry we are in as long as it can somehow or other propagate money. This sometimes makes us unloved by people who have built up a business, because they resent the fact that we do not want to stick with them in sickness or in health.

Now the steel industry has been extremely healthy in 1947. It has completed its first peacetime year of capacity operations. This is a historic event of the first importance and should have been celebrated in Wall St. by wild and cheerful buying of steel stocks, but it wasn't. Steel stocks have not done badly but they have not done nearly as well as the earnings and the prospects of continued capacity operations would seem to justify. Does this indicate some hidden form of poor health?

Along with many others in Wall St. I have liked the steel industry (from our hard eyed point of view) and I still do, but I have lately detected a symptom of ill health which I think should be brought to more general attention. The steel industry is not earning enough money and it is expanding too much.

I know that Phil Murray, Harry Truman, etc. think the industry is making plenty of money and is expanding too little. There is some tendency in the industry itself to think they are making high enough profits and ought to expand further. So why does Papa Wall St. think differently?

Wall St.'s real thoughts are not

**Editor's Note:** Government, industry, labor, and the public at large have all expressed their views on the need, or lack of need, for expansion in the steel industry. Walter K. Gutman, research department, Goodbody & Co., in this special report to THE IRON AGE, tells his impressions of how Wall Street views the steel industry.

expressed in words but in deeds. When Wall St. thinks things are jim-dandy, stocks go up, when it thinks things are terrible they go down, and when it is confused they do so-so. Well Wall St. is confused. The steel industry is earning a lot of dollars, but where go the dollars and how good are they? U. S. Steel

Co. is a well financed company with \$600 million of net current assets and an enormous accumulation of various sorts of plant capacity, plus capacity to feed the plants with iron ore, scrap, limestone, coke, etc. This should be the harvest time for its stockholders. As the dividends pour out from this effulgent fountain of wealth they should roll around in Buick convertibles, be seen at late hours at the Blue Angel, breakfast on caviar and champagne.

Well, the fact is they are getting only 25 pct more dividends now than they got 5 or 6 years ago, and these of course are worth only 50¢ on the \$1. Only one third of the net reported after income taxes is coming to them. The rest is going into new plant, and the new

## Somebody's Gotta Be It



plant of course is high cost plant, not a bargain. The so-called high earnings are, for the most part, simply being turned over into high cost plant.

Since construction costs have not been held down either by conscience or law, whereas steel prices have been held down by conscience, the turnover of profits into plant is probably at a net loss of some sort to the stockholder. The special reserves being set up by some companies to "write down" some of the high cost of the new plant bears out this point. So, in terms of purchasing power, the stockholders are getting less out of their property than they have gotten in any prosperous year of the company's history, and they have no way of knowing the true value of the new plant.

So what? Suppose Wall St. weeps, how does that hurt the country? There is the point, can we or can we not have a prosperous private economy without having a vigorous stock market? If we can, let's forget Wall St. Let Wall St. be old leaf mold on the roots of progress. But, if financial leaf mold is made from stock certificates, and if a vigorous stock market breeds such certificates, there may be a

general usefulness in sopping up some of Wall St.'s tears.

Let us suppose that the steel industry did not expand or modernize (except here and there in a small way) and paid out 90 pct of its present boom time earnings. Let us suppose that its presidents and vice-presidents read the Bible instead of the report of the President's economic advisors, what would happen? The Bible says somewhere in Kings (or perhaps Exodus) that there are times to reap and times to sow, times to store up and times to throw away. Obviously a time to reap the benefits of past investment in plant is during inflation, and the times to store up dollars is when they are easy to get. New plant capacity can be planted when the inflation is over.

Neither the steel industry nor any other single industry can control the economy of the whole world, or even the nation. If 80 pct of the world's economy is moving toward inflation, the steel industry cannot stop it. The idea that steel is so basic that it controls the rest of the economy has been exaggerated. There are only \$200 of steel in an automobile, yet the gray market markup on new cars is \$500 over list price. Every time the cost of

steel goes up \$5 the cost of a car goes up \$200. Steel is an important excuse, not a reason, for the inflationary spiral. Being honest about this would get steel executives in hot verbal water no doubt, but as Chaucer says: "Truthe will deliver, there is no drede."

The economic truth of putting list prices for steel where they belong, and of paying out rich boom time dividends to stockholders, would, in my opinion, have these beneficial effects:

(1) It will end the gray market. The use of steel will be limited to those industries able to pay the list prices. If essential industries are truly essential they would get their steel. In other words, a higher list price for steel might result in more steel for pipelines and freight cars.

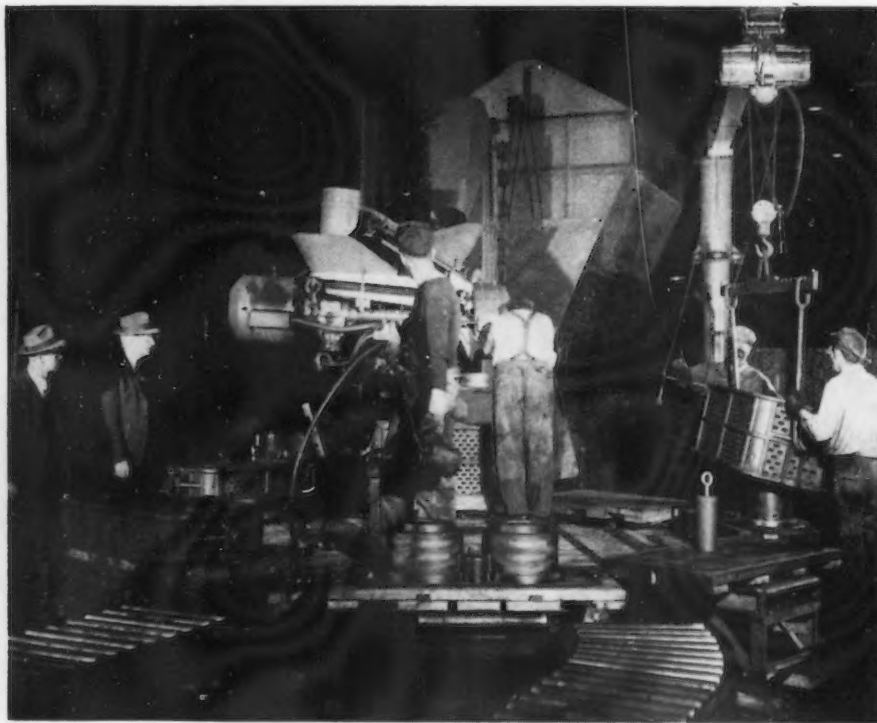
(2) It would not hurt the consumer. Consumer prices are pretty free prices. They are already at their natural economic levels. It would squeeze the profit margins of many of those who are now squeezing the consumer. In other words more of the money would go to the owners of essential big business, and less to the fringe business man and speculator.

(3) It would make ownership, via the stock market, of big business a paying proposition. Equity values would be in line with productive power.

(4) With equity values in line with productive power it would be possible for expansion in the industry to pay its way. The industry would be able to raise new money on favorable terms, and the nation would benefit by an industry which because of its earning power can justify expansion, even at high prices for new facilities. This is the way free enterprise is supposed to work.

(5) It would not result in higher wage scales. The unions already claim the industry is earning too much. But if the industry were losing money the unions would still strike out for higher wages as long as they thought they could be gotten. Has the Transit Union in New York been bashful just because the city is losing money from its subway operations? It is the legitimate job of the union leader to use any argument which is handy to do the best possible by his men. It should be the job

**MORE PRODUCTION:** Foundry output of sheaves for Texrope V-belt drives was greatly increased with the installation of latest equipment in a production line at Allis-Chalmers. Part of the setup is built around a stationary sand slinger unit, a 16-ft turntable and a complete sand conditioning unit. The turntable has eight stations.





of the company officer to do the same by his stockholders. I think there has been a little tendency on the part of company officers to see too many sides to the question. The truth can be better beaten out if each proponent polishes up his side. A sensible American compromise should always be possible.

(6) What would the government do? The government can't do any more than it has powers to do, and it's always better to die fighting than being walked on. If making lots of 50¢ dollars is a healthy thing for the farmer and results in higher production, it's a healthy thing for the steel

industry. Sure the industry would be accused of profiteering. But what is profiteering? Is it profiteering to reap the harvest of a long and patient acquisition of useful facilities? These facilities were acquired when a \$1 was a \$1, sometimes a \$1.25. We keep on forgetting that the dollar has changed. Facilities put in place when each dollar was valuable should earn a high number of dollars when the value has declined. The gray market speculator is not giving good value, the horde of hangers-on and the commission splitters are not giving good value. But the steel industry has been giving good value

and is being underpaid. Karl Marx said capitalism would commit suicide. There is some evidence that the stock market thinks that big business is dying of anemia.

(7) Would high prices for steel stimulate competition from other materials? Very likely this would benefit the country. We need new materials and new methods. It might or might not hurt the steel industry. Anyway these new materials are coming. If they have real service to offer, keeping steel fairly cheap won't stop them. If steel is going out it's going out and it's best to have it go out in a blaze of dividends.

## Minimum Wage Exemption For White Collars Hit

Washington

••• Recommendation that the minimum wage exemption requirements under the Wage-Hour Act for executive, administrative and professional be increased from the present \$200 monthly to \$275 monthly or \$60 weekly was made to the Labor Dept.'s public contracts division by S. A. McCaskey, Jr., secretary of Allegheny-Ludlum Steel Corp.

The contracts division is holding a series of hearings on proposals to amend Part 541 of the wage-hour regulations. The hearings, which began Dec. 2 and will continue into January, have brought out varied proposals concerning the increase in salary exemption requirements.

Greatest increase sought to date has been \$500 monthly recommended by the CIO United Electrical Workers; the Ladies' Garment Workers was more moderate, suggesting \$100 weekly be set as a minimum. Management, as a whole, has held to a lower minimum ranging from the present limit to \$275 monthly.

The \$275 minimum, McCaskey said, is "more realistic" in view of present conditions. He added that he believed that this increase would solve many of Allegheny's problems in respect to deciding which employees are exempt in the three classifications.

"It is our belief that if the minimum salary requirement is raised (to \$275), no need would really exist for the work requirement

provisions in these three classifications," he added.

He also pointed out that in negotiating union contracts, most steel contracts contain agreements guarding against foremen, for instance, assisting production workers to the extent that a job might be displaced.

It has been a common practice of his company, he said, to resolve doubtful cases in favor of non-exemption and pay overtime when a doubt existed. He added that Allegheny-Ludlum had paid overtime in many cases where he was sure that no such premium payment had been intended by Congress.

## Hospital Bids Are In

Buffalo

••• Fleischer Engineering & Construction Co. submitted a low bid of \$9,287,000 for construction of the main building of the Buffalo Veterans Administration Hospital. The figure exceeded the government's estimate by \$367,414. The only other bid was \$10,313,500 by the John W. Cowper Co.

The Siegfried Construction Co. submitted the only bid on residences and attendants' quarters. It was \$422,874 for four complete buildings.

**CYCLE COMPLETED:** Dravo Corp., which built LSM's for the Navy during the war, has bought two of them back. They'll be dismantled to furnish scarce materials and equipment for new high powered river towboats. One of the LSM's is shown here arriving at the company's Neville Island, Pittsburgh, shipyard on its last trip.



## Martin Committee Report to Senate Awaited by Steel Industry

### Washington

• • • The Senate Small Business Committee, fully realizing the political significance of the steel capacity expansion debate, will not involve itself in the fray but will continue to play the role of umpire on Capitol Hill.

Testimony presented to the committee over the last 8 months does, however, strongly suggest that the Martin subcommittee's forthcoming report on steel to the Senate will include several points of concern to the industry.

The subcommittee investigations point to a probable request for a study and report by the Federal Trade Commission of distribution practices by larger steel companies. These points will include sales of steel to large integrated operations, purchase and removal of other steel facilities from normal channels of trade—such as in the automobile industry—and withdrawal from historical distribution in some areas.

*FTC has been studying most of these points for the past year, but the work has been moving slowly and a final report is many months away (THE IRON AGE, Apr. 3, p. 101, and Oct. 30, p. 78).—Ed.*

Similarly, evidence gathered by the committee in its investigations

### Testimony Indicates Report Will Cover Distribution, Allocation and Scrap

By GEORGE BAKER  
Washington Bureau

and in hearings clearly points to the fact that the historical quota system of distribution has broken down to a large degree. Company policing of sales for suspected diversion of purchases will go a long way toward correcting some abuses, according to Senator Martin, R., Pa. The Senator's views to this effect were aired in a meeting with producers on Sept. 12 (THE IRON AGE, Sept. 18, p. 114).

Despite clamor from some proponents of small business for government allocation of steel output, a majority of committee members are of the opinion that voluntary allocations, such as those proposed by Rep. Wolcott, R., Mich., chairman of the House Banking Committee, will be sufficient to bring about stabilized domestic distribution and at the same time

permit diversion of a certain percentage of the total output for European rehabilitation under the European Recovery Plan.

The committee feels that the European Recovery Plan should be administered by an independent agency consisting of industrial leaders who will be directly responsible to Congress.

Memories of the malfunctioning of inexperienced executives of the War Production Board and Office of Price Administration are still crystal-clear to the committee.

The committee majority will take the lead on the floor of the Senate to insist on the execution of the aid program by responsible leaders of the industries involved.

The committee probably will seek legislation amending the Surplus Property Act of 1944 to the extent that all remaining surplus ferrous materials now under government control be earmarked for immediate inventory and sale.

The group will also sponsor legislation to carry out prompt determination and sale of unserviceable materials for use as scrap.

The committee is firm in its belief that prompt return of all available scrap, both from domestic and overseas sources, is a matter of urgent necessity.

### Bethlehem Buys Million Tons of Pacific Scrap; Delivery to Start Soon

#### New York

• • • Bethlehem Steel Co.'s purchase of a million tons of scrap from the Chinese Government is the best news Eastern mill scrap buyers have heard for years. It means that for 1948 and 1949 Bethlehem will be bidding for about half a million fewer tons of scrap. Observers believe this new tonnage will tend to depress steel scrap prices in the East.

Bethlehem spokesmen confirm the fact that there is approximately 1 million tons of unprepared scrap involved in the purchase from the Orient. Purchase

price was \$30 million, of which \$18 million will be shipping costs. The material was sold by China to General Commodities Corp., which acted as agent for the steel company. It is war surplus on numerous Western Pacific islands which was transferred by the United States to China in September 1946 in payment for debts owed China by the U. S. Government. The U. S. Government, it is said, waived the no-return clause because of the critical scrap supply in this country.

The first shipload is due in Baltimore in January. It will be unloaded and prepared by Patapsco Scrap Corp., a Bethlehem ship-breaking subsidiary. The price of \$30 delivered Baltimore should give the steel company a fairly

good value even though it needs preparation because considerable tonnages of cast iron scrap will be recovered. Much of the material is believed to be unserviceable jeeps, trucks and combat vehicles.

According to trade sources, Bethlehem buys about 3 million tons of steelmaking scrap annually. Of this, probably 2 million tons are bought in the open market. The balance is believed to come from returned customer scrap. If all goes well Bethlehem will by this purchase be able to reduce its free market buying by 25 pct in 1948 and 1949. This assumes that it will take 2 years to complete shipment of the material from the Orient though current plans call for doing the job in 18 months.



## Scrap Shortage Has Reduced Production Of Steel This Year

Washington

• • • Lack of proper scrap, both as to quantity and quality, has reduced 1947 steel production by about 3 million tons, spokesmen for the Steel, Foundry and Scrap Industries' expediting committee, told the Martin steel subcommittee last week.

Furthermore, the Senate group was told, the situation is getting more complicated because of the European rehabilitation requirements under the Marshall Plan. Exclusive of these demands, it was said, monthly requirements exceed 4.3 million tons.

The committee was represented by Edwin C. Barringer, L. D. Green and John F. Lane at a hearing called by the subcommittee to investigate pig iron and scrap shortages. This followed numerous complaints by foundries that lack of both was threatening their operations.

While there has been some improvement in the visible scrap inventory since the first of the year, it was declared, as of September, latest figures available, it was down to less than 4.2 million tons.

While no figures are yet available, the committee said it has started the movement of potential government scrap back into industry channels through its 30 regional subcommittees. These are seeking out scrap potential now in storage. An increasing awareness of scrap needs on the part of government officials has resulted from these efforts, it was said.

As of September, the committee said, the national visible scrap inventory consisted of 2.6 million tons of purchased and 1.2 million tons of home scrap in consumers' stocks. Dealers' stock consisted of 202,000 tons.

Representatives of labor and the foundry industry had previously told the Martin subcommittee that unless more pig iron is made available, some foundries will have to sharply curtail operations and others will have to close down entirely.

Unless additional pig iron becomes available, it was said, 50,000 gray iron foundry workers would be out of work before the end of the year. This will seriously impede production of soil pipe and heating equipment for the housing program as well as agricultural machinery and equipment, it was emphasized.

It was suggested by the founders that the government initiate a new scrap metal drive throughout the country. Founders, it was testified, were having to pay up to \$55 a ton for scrap "when they could get it, even at that price."

## Hudson Acquires Mill

Detroit

• • • Hudson Motor Car Co., which this week leased two-thirds of the former Shenango tin plate mill of Carnegie-Illinois Steel Co. at New Castle, Pa., has explained to its steel suppliers that the company has no plans for remaining indefinitely in the steel business. Rather, Hudson has said that the company will decrease its operations as rapidly as a supply of

flat rolled steel becomes available.

Informed sources here have reported that the equipment necessary to begin operations has been assembled and that arrangements have been made to supply the necessary tonnage of ingots. However, there are indications that arrangements for obtaining sheet bars have not been completed and there were unconfirmed reports that Hudson is looking for a sheet bar source. Hudson officials have estimated that the plant will be able to turn out 50,000 tons per year under favorable operating conditions. Most sources believed that the company will limit its operations to the production of hot rolled flat products.

## Midland Steel Will Pay Dividends of \$4 Share

Cleveland

• • • Midland Steel Products Co., following a directors' meeting Dec. 5, announced declaration of a dividend of \$2 per share on the company's 8 pct cumulative first preferred stock, payable Jan. 1, 1948, and 50¢ per share on the noncumulative dividend shares; and \$2.50 per share on common stock, the latter two payable Dec. 23, 1947. All of these dividends are payable to shareholders of record Dec. 16, 1947.

This declaration will make a total of \$4 per share on the common stock for 1947, this being the first year since 1941 when more than \$2 per share was paid.

E. J. Kulas, president, stated that sales for 1947 will be approximately 78 pct greater than for the year 1941.

MODERN COLUMBUS: LVT trail party, commanded by Vernon D. Boyd, Arlington, Va., returns to Little America IV after a seven-day trip into the interior of Antarctica. The party established an emergency food and fuel cache at the foot of Mt. Helen Washington.



## Saudi Arabia to Benefit Under Pipe Export Limits

Washington

••• About 28 pct of fourth quarter seamless and welded steel pipe exports have been allocated to the Saudi Arabian project under the quotas established by the Dept. of Commerce, it is indicated by Census Bureau statistics.

Fourth quarter allocations amounted to 78,517 tons of the two classifications, the figures show, consisting of 44,435 tons of welded and 34,082 tons of seamless.

Total shipments proposed for all types of pipe, including cast iron pressure pipe (9000 tons), welded black pipe (25,000),

wrought iron (1500), and galvanized steel (13,000), amounted to 117,017 tons.

Set aside for Saudi Arabia were 20,463 tons of welded and 1632 tons of seamless steel pipe. This is the project which Secretary of Defense Forrestal recently told a Congressional committee is essential to the national interest.

The remaining distribution of the fourth quarter quota of welded and seamless pipe is scheduled as follows (welded quotas in parenthesis):

Central America, 1217 tons (165); South America, 26,286 (22,243); Near East, including Arabia, Egypt, Iraq and Persian Gulf, 6665 (16,363), and the East Indies, 1894 (6).

## Pig Iron Output to Be Increased 280,000 Tons

Washington

••• An estimated 280,000 tons annual output of pig iron will be added to total industry production by Apr. 1 and will go "a long way" toward relieving the current shortage of soil pipe, War Assets Administration has predicted.

The additional capacity is expected to be brought into production next spring with repair of a government-owned blast furnace at the Gadsden, Ala., works of Republic Steel Corp. Arthur McKee & Associates have contracted with WAA for the necessary stack relining.

### AMERICAN IRON AND STEEL INSTITUTE SHIPMENTS OF STEEL PRODUCTS ALL GRADES INCLUDING ALLOY AND STAINLESS (Net Tons)

OCTOBER - 1947

Steel Products	Number of companies	Items	Current Month		To Date This Year		Whole Year 1946	
			Net Shipments (Including Shipments to Members of the Industry for Conversion into Further Finished Products or For Remelt)	Per cent of Total Shipments	Net Shipments (Including Shipments to Members of the Industry for Conversion into Further Finished Products or For Remelt)	Per cent of Total Shipments	Net Shipments (Including Shipments to Members of the Industry for Conversion into Further Finished Products or For Remelt)	Per cent of Total Shipments
			(Net Tons)		(Net Tons)		(Net Tons)	
Ingot, blooms, billets, tube rounds, sheet and tin bars, etc.	41	1	281,223	4.9	229,572	4.8*	1,809,014	4.0
Structural shapes (heavy)	13	2	398,728	7.0	166	7.1	2,558	7.1
Steel piling	4	3	28,452	0.5	-	0.5	23	0.4
Plates (sheared and universal)	29	4	589,108	10.4	19,115	10.0	183,554	8.5
Skelp	7	5	10,705	0.2	38,707	0.3	329,199	0.5
Rails—Standard (over 60 lbs.)	4	6	189,535	3.3	126	3.5	991	3.7
—All other	5	7	24,748	0.4	62	0.3	329	0.3
Joint bars	7	8	14,989	0.3	1,671	0.3	13,423	0.4
Tie plates	9	9	45,271	0.8	394	0.8	4,137	0.9
Track spikes	8	10	13,830	0.2	-	0.3	74	0.3
Hot Rolled Bars—Carbon	34	11	555,071	9.8	67,488	10.0	614,789	10.3
—Reinforcing—New billet	15	12	115,944	2.0	1,214	2.0	8,635	2.1
—Reinforcing—Rolled	12	13	17,524	0.3	-	0.3	141,346	0.3
—Alloy	27	14	144,749	2.6	18,488	2.8	178,261	2.8
—TOTAL	45	15	833,288	14.7	87,190	15.1	801,685	15.5
Cold Finished Bars—Carbon	29	16	114,692	2.0	1,130	2.5	7,978	2.7
—Alloy	26	17	15,082	0.3	325	0.4	1,988	0.4
—TOTAL	35	18	129,774	2.3	1,455	2.7	9,966	3.1
Tool steel bars	19	19	6,589	0.1	61	0.1	1,224	0.2
Pipe & Tubes—Butt weld	15	20	156,582	2.7	7,061	2.7	57,178	2.6
—Lap weld	8	21	30,413	0.5	45	0.6	797	0.6
—Electric weld	11	22	105,075	1.8	299	1.7	1,984	1.4
—Seamless	10	23	183,778	3.2	12,499	3.3	115,034	3.8
—Conduit	7	24	14,503	0.3	904	0.2	7,122	0.2
—Mechanical and pressure tubing	13	25	60,300	1.1	1,652	1.0	17,035	0.9
Wire rods	22	26	62,810	1.1	31,809	1.1	278,423	1.4
Wire—Drawn	39	27	249,154	4.4	15,613	4.1	150,451	4.0
—Nails and staples	18	28	68,430	1.2	521	1.3	6,990	1.3
—Barbed and twisted	15	29	24,612	0.4	1	0.4	68	0.4
—Woven wire fence	13	30	39,164	0.7	327	0.6	3,118	0.8
—Bale ties	12	31	10,214	0.2	-	0.2	-	0.2
Black Plate—Ordinary	9	32	62,946	1.1	-	1.3	1,853	1.6
—Chemically treated	8	33	588	-	-	-	-	0.3
Tin and Terne Plate—Hot dipped	9	34	196,526	3.5	-	3.3	228	3.9
—Electrolytic	9	35	152,008	2.7	-	2.5	529	1.9
Sheets—Hot rolled	31	36	659,149	11.6	48,747	11.5	477,456	11.3
—Cold rolled	17	37	480,265	8.5	2,805	8.6	22,669	8.4
—Galvanized	16	38	148,997	2.6	107	2.6	656	3.0
—Electrical and enameling	10	39	54,206	1.0	-	0.9	385	0.9
Strip—Hot rolled	23	40	157,444	2.8	30,231	2.8	248,724	2.8
—Cold rolled	34	41	151,309	2.7	2,829	2.6	23,683	2.6
Wheels (car, rolled steel)	5	42	29,668	0.5	-	0.6	2	0.5
Axles	5	43	17,416	0.3	-	0.3	53	0.3
All other	-	44	-	-	-	-	-	-
<b>TOTAL STEEL PRODUCTS</b>	<b>142</b>	<b>45</b>	<b>5,681,597</b>	<b>100.0</b>	<b>533,969</b>	<b>52,303,905</b>	<b>4,570,615</b>	<b>48,775,532</b>

During 1946 the companies included above represented 99.5% of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

\* Adjusted.



## AMERICAN IRON AND STEEL INSTITUTE

## Production of Open Hearth, Bessemer and Electric Steel Ingots and Steel for Castings

## YEAR 1947

(Preliminary)

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production, all companies (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January.....	6,544,841	95.1	384,096	87.7	284,309	65.9	7,213,246	93.0	1,628,272	4.43
February.....	5,830,371	93.8	314,912	79.6	276,779	71.1	6,422,062	91.7	1,605,515	4.00
March.....	6,614,369	96.1	378,893	86.5	314,224	72.9	7,307,486	94.3	1,649,545	4.43
1st Quarter.....	18,989,581	95.0	1,077,901	84.8	875,312	69.9	20,942,794	93.1	1,628,522	12.86
April.....	6,360,600	95.4	375,675	88.6	306,422	73.4	7,042,697	93.8	1,641,654	4.29
May.....	6,634,716	96.4	372,878	85.2	321,903	74.6	7,329,497	94.5	1,654,514	4.43
June.....	6,312,674	94.7	351,247	82.8	304,744	73.0	6,968,665	92.8	1,624,397	4.29
2nd Quarter.....	19,307,990	95.5	1,099,800	85.5	933,069	73.7	21,340,859	93.7	1,640,343	13.01
1st 6 Months.....	38,297,571	95.3	2,177,701	85.2	1,808,381	71.8	42,283,653	93.4	1,634,467	25.87
July.....	6,028,707	87.8	256,125	58.6	285,322	66.3	6,570,154	84.9	1,486,460	4.42
August.....	6,324,456	91.9	346,033	79.0	311,597	72.2	6,982,086	90.1	1,576,092	4.43
September.....	6,147,448	92.4	334,425	79.0	306,769	73.6	6,788,642	90.6	1,586,131	4.28
3rd Quarter.....	18,500,611	90.7	936,583	72.2	903,688	70.7	20,340,882	88.5	1,549,191	13.13
9 Months.....	56,798,182	93.7	3,114,284	80.8	2,712,069	71.4	62,624,535	91.8	1,605,757	39.00
* October.....	6,826,548	99.2	384,272	87.8	349,545	81.0	7,560,365	97.5	1,706,629	4.43
† November.....	6,550,897	98.3	360,620	85.0	338,006	80.9	7,249,523	96.6	1,689,866	4.29
December.....									4.42	
4th Quarter.....									13.14	
2nd 6 months.....									26.27	
Total.....									52.14	

Note—The percentages of capacity operated are calculated on weekly capacities of 1,553,721 net tons open hearth, 98,849 net tons Bessemer and 97,358 net tons electric ingots and steel for castings, total 1,749,928 net tons; based on annual capacities as of January 1, 1947 as follows: Open hearth 81,010,990 net tons, Bessemer 5,154,000 net tons, Electric 5,076,240 net tons, total 91,241,230 net tons.

\* Revised  
† Preliminary figures, subject to revision.

## YEAR 1946

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		*Calculated weekly production, all companies (Net tons)	Number of weeks in month
	*Net tons	Percent of capacity	Net tons	Percent of capacity	*Net tons	*Percent of capacity	*Net tons	Percent of capacity		
January.....	3,530,192	51.1	207,512	47.4	135,183	28.9	3,872,887	49.6	874,241	4.43
February.....	1,301,719	20.9	25,905	6.6	65,058	15.4	1,392,682	19.8	348,171	4.00
March.....	5,950,241	86.2	363,949	83.1	194,574	41.6	6,508,764	83.3	1,469,247	4.43
1st Quarter.....	10,782,152	53.8	597,366	47.0	394,815	29.1	11,774,333	51.9	915,578	12.86
April.....	5,336,317	79.8	286,088	67.5	238,790	52.8	5,861,195	77.5	1,366,246	4.29
May.....	3,702,184	53.6	153,409	35.0	217,027	46.4	4,072,620	52.2	919,327	4.43
June.....	5,148,660	77.0	251,253	59.2	225,860	49.9	5,625,773	74.4	1,311,369	4.29
2nd Quarter.....	14,187,161	69.9	690,750	53.7	681,677	49.7	15,559,588	67.9	1,195,971	13.01
1st 6 months.....	24,969,313	61.9	1,288,116	50.4	1,076,492	39.4	27,333,921	59.9	1,056,588	25.87
July.....	6,027,388	87.5	365,332	83.6	225,963	48.5	6,618,683	84.9	1,497,440	4.42
August.....	6,291,363	91.1	373,837	85.4	259,322	55.5	6,924,522	88.7	1,563,098	4.43
September.....	5,951,232	89.2	371,465	87.8	232,869	51.6	6,555,566	86.9	1,531,674	4.28
3rd Quarter.....	18,269,983	89.3	1,110,634	85.6	718,154	51.8	20,098,771	86.8	1,530,752	13.13
9 months.....	43,239,296	71.1	2,398,750	62.2	1,794,646	43.6	47,432,692	69.0	1,216,223	39.00
October.....	6,312,604	91.4	387,933	88.6	251,205	53.8	6,951,742	89.0	1,569,242	4.43
November.....	5,873,264	87.8	318,350	75.1	266,157	58.8	6,457,771	85.4	1,505,308	4.29
December.....	5,286,799	76.7	222,704	51.0	250,998	53.8	5,760,501	73.9	1,303,281	4.42
4th Quarter.....	17,472,667	85.3	928,987	71.5	768,360	55.4	19,170,014	82.8	1,458,905	13.14
2nd 6 months.....	35,742,650	87.3	2,039,621	78.5	1,486,514	53.6	39,268,785	84.8	1,494,815	26.27
Total.....	60,711,963	74.7	3,327,737	64.6	2,563,006	46.6	66,602,706	72.5	1,277,382	52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,558,041 net tons open hearth, 98,849 net tons Bessemer and 105,491 net tons electric ingots and steel for castings, total 1,762,381 net tons; based on annual capacities as of January 1, 1946 as follows: Open hearth 81,236,250 net tons, Bessemer 5,154,000 net tons, Electric 5,500,290 net tons, total 91,890,540 net tons.

\* Revised January through December, 1946.

## Industrial Briefs . . .

• **TO MANUFACTURE GAGES** — Pratt & Whitney Div. of Niles-Bement-Bond Co. has taken over the manufacture of continuous electrical gages for rolling mills, strip mills, paper mills and similar operations of the Magnetic Gage Co. of Akron. Operations will be continued at the Akron plant until early next year at which time they will be moved to West Hartford, Conn.

• **NEW MILL DEPOT** — A new mill depot has been opened recently at 11-26 46th Road, Long Island, N. Y., by the Wolverine Tube Div., Calumet & Hecla Consolidated Copper Co., Inc., of Detroit. The depot will stock seamless nonferrous tube in the form of S.P.S. pipe, copper water tube and refrigeration tube.

• **MORE ACETYLENE** — Construction will start soon on an oxygen filling station and acetylene producing plant at W. 29 St., west of Woodrow St., Little Rock, Ark., the Linde Air Products Co., unit of Union Carbide & Carbon Corp., announced recently. The plans also include a warehouse for the distribution of carbide.

• **FORMS BEARING FIRM** — Organization of Dalc Bearings, Inc., has been announced. Offices will be opened at 1974 Broadway, New York City, on Jan. 2, 1948, to distribute ball and roller bearings and antifriction products manufactured by the SKF, Fafnir, Federal, Schatz and Timken bearing companies and the Bunting Brass & Bronze Co.

• **CLOSING WAREHOUSE** — Announcement has been made by William Jessop & Sons, Inc., of the closing of their warehouse in New York on Dec. 30. All their tool steel can be obtained through their authorized agents, James A. Coe & Co., 395 Washington St., Newark, N. J.

• **TOOL REPRESENTATIVE** — Lovejoy Tool Co., Inc., Springfield, Vt., announces the appointment of Burleigh-Stocker Machinery Co., 23675 Woodward Ave.,

Pleasant Ridge, Mich., as exclusive representative in eastern Michigan to handle their complete line of metal cutting tools.

• **S. & M. EXPANDS** — The S. & M. Mfg. Co., Milwaukee, steel fabricators, has purchased the Cleaver-Brooks Co. plant at 5100 N. 53 St. Cleaver-Brooks will continue to occupy a portion of the office and space in the shop for its research and development division.

• **OPENS SALES OFFICE** — Inland Steel Co., Chicago, has announced the opening of a Davenport, Iowa, district sales office, effective Jan. 5, 1948. The office will be located in suite 911 of the Kahl Bldg.

• **SALES OUTLET** — Announcement of the appointment of the Industrial Sales Co., 339 Carondelet St., New Orleans, as factory representatives of the Berger Mfg. Div., Republic Steel Corp. has been made. Industrial Sales will handle the complete Berger line of steel lockers, shelving, shop equipment, filing and storage cabinets.

• **YODER GROWS** — Yoder Die Casting, Inc., has announced the opening of their new plant at 727 Kiser St., Dayton.

• **ANNIVERSARY** — Stewart Warner Corp., Chicago, has held an open house recently to mark the thirty-fifth anniversary of its founding.

• **TO BUILD DOCKS** — Coal and ore docks, an \$18,500,000 facility being built jointly by the B & O and the N. Y. Central Railroads, will open at Maumee Bay, Lake Erie, next spring.

• **TO HANDLE PRESSES** — The Lake Erie Engineering Corp., Buffalo, has appointed Rieder Thoreson and Fred McCosh 1115 Book Bldg., Detroit, to handle their complete line of metal-working and plastic molding hydraulic presses in the entire states of Michigan and Ohio.

## European Letter

(CONTINUED FROM PAGE 98)

vances in the cost of living occur, further wage adjustments will be necessary.

Admittedly such a policy entails the risk of giving the final spin to inflation, but the policy of increasing wages—the Communists' only sound plank — could be combined with a new effort at stability in the crucial sector of food.

Draconian measures against black marketeers have been passed by the Assembly, but have remained in abeyance. They should now be used to disgorge the hoarded food held by peasants and wholesalers alike and thus to allow increased supplies to reduce the skyrocketing prices in the towns. The government would better assert its authority by imposing hard labor on the largest black market operators than by passing antistrike laws which could give the Communists an opportunity later to restore their authority.

**Y**ET having searched the dark skies of France for a break in the clouds and having found a timid ray of light here and there on the horizon, one has to admit that these possibilities open to moderate government depend upon its own coherence, energy and vision. And it is here that pessimism must grip any observer of the French scene.

Although for the time being, the Communists have succeeded in creating a solid majority against them, it is a negative coalition and M. Schuman will have the greatest difficulty in holding together a team which includes the Left wing of the Socialists, the wary conservatism of many MRP members, and is under constant pressure from General de Gaulle's group on the extreme Right.

Save on the question of quelling the Communists, what issue unites these men? On what methods of government can they agree? Can they even accept the basic principle that in the bitter months ahead some attempt shall be made to ensure that France's hardships are evenly spread and borne? It is the likelihood that no figure or group in the Center has either the vision or the leadership to make center government viable that leads even France's warmest friends to "despair of the Republic" and to look over their shoulders apprehensively at the waiting General.



## Weekly Gallup Polls . . .

### Many Believe Federal Government Treats Indians Fairly

#### Princeton, N. J.

• • • The weight of voter opinion, numerically speaking, leans toward the belief that the federal government is treating the nation's Indian population fairly. However, nearly two fifths of voters believe the treatment has been unfair, according to George Gallup, director, American Institute of Public Opinion.

President Truman gave official recognition to one aspect of the problem; namely, the plight of the 60,000 Navajo Indians. He will seek congressional approval for a long-range program to improve living conditions of the tribe which lives on a 25,000 sq. mile tract in Arizona, New Mexico, Colorado and Utah.

To test public sentiment on the question, institute interviewers throughout the country posed this question to thousands of representative voters:

"From what you have heard or read, do you think the U. S. government has treated the Indians fairly?"

The replies:

	Pct
Treated fairly . . . . .	44
Not treated fairly . . . . .	38
No opinion . . . . .	18

Those who answered that the treatment had been unfair were asked in what way was it unfair.

Their answers:

	Pct
Government took land without adequate compensation . . . . .	29
Promises were not kept, general ill-treatment . . . . .	22
Indians don't have full citizenship rights . . . . .	10
Segregation on reservations unfair . . . . .	7
Indians given poor land for their reservations . . . . .	6
Economic opportunities poor . . . . .	4
Educational opportunities poor . . . . .	3
Miscellaneous . . . . .	11
Don't know . . . . .	8

Another question on the same ballot was:

"Do you think Indians should or should not have the right to vote in New Mexico and Arizona?"

The replies:

	Pct
Should have vote . . . . .	80
Should not . . . . .	4
No opinion . . . . .	16

In past years a number of states

had restrictions against Indian balloting, but now only New Mexico and Arizona laws continue the prohibitions. The President's Committee on Civil Rights, headed by Charles E. Wilson, recently recommended revisions of the state constitutions involved to eliminate the discrimination. The Committee pointed out that Indians are now citizens, paying state and federal taxes, and that there is, "therefore, little justification for denying them the right to vote."

• • • Although America by tradition is a land which freely tolerates all sorts of minority political parties expressing widely varied points of view, the majority of Americans seem to regard the Communist Party as a distinctly different kind of thing.

Voters polled by the institute indicate their belief that the Communist Party is not a truly American party but one whose loyalty is to a foreign power—Russia. To that extent it is regarded by the majority as a subversive party. Largely for that reason the majority polled by the institute say they think membership in the party ought to be outlawed.

The question of whether it would be wise policy to try to suppress the Communist Party has often been debated. Some observers have contended that this would simply drive the Communists underground and make martyrs of them.

It is interesting to note that among American voters with a college education there is considerably less sentiment in favor of suppressing the Party than there is among voters who have only gone through grade school or high school. There is more anti-Communist - Party sentiment, too, among manual workers and farmers than among professional and business people.

The widespread belief current today that American Communists are directly under the thumb of

### American Communists Seen More Loyal to Russia than U.S.; Marshall Plan Gains Support

Moscow is shown in another of the questions put in the recent poll.

"Do you think the Communists in this country actually take orders from Moscow?"

The vote:

	Pct
Yes . . . . .	62
No . . . . .	13
No opinion . . . . .	25

• • • There has been a sharp overall increase in public approval of the Marshall Plan for aid to Europe.

During November more voters became familiar with the general idea of the plan, and the number indicating support climbed to a substantial majority for the first time since Secretary of State George C. Marshall enunciated the plan last June. Favorable opinions on the principle of the plan now outweigh unfavorable opinions by better than 3-to-1.

As in past surveys, the institute probed attitudes on the issue through the use of a number of questions, designed to find out how many people know about the plan, how clear an idea they have of its purpose, what they think of the plan in general, and whether they are willing to see large sums of money spent to carry it out.

The issue which Congress is called upon to decide is whether to approve an expenditure of some \$20 billion over the next 4 years to provide aid to the 16 European countries who are cooperating under the Marshall Plan.

(CONTINUED ON PAGE 128)

# Construction Steel . . .

## New York

• • • Fabricated steel awards this week included the following:

- 500 Tons, Kokomo, Ind., mill building extension for Continental Steel Co. to Indiana Bridge Co., Muncie, Ind.
- 200 Tons, Kingman, Ariz., bulkhead gates for Davis Dam Project, Bureau of Reclamation, Denver, Spec. 1953, to Independent Iron Works, Oakland, Calif.
- 110 Tons, Philadelphia, Chase Brass & Copper Co., building, to Bethlehem Steel Co., Bethlehem.
- 100 Tons, Oral, S. D., bridge 202, U. S. Bureau of Reclamation, to American Bridge Co., Pittsburgh.

• • • Fabricated steel inquiries this week included the following:

- 9425 Tons, Tampa, Fla., Tampa Bay bridge.
- 2300 Tons, Philadelphia, four carfloats, Pennsylvania R.R., bids in.
- 1200 Tons, Philadelphia, ten barges, Pennsylvania R.R., bids in.
- 1000 Tons, Maine, 19 state bridges.
- 300 Tons, Erie County, Pa., bridge, Pennsylvania Dept. of Highways, Dec. 19.
- 285 Tons, Clallam County, Wash., road construction and bridges over Sol Duc River, PSH No. 9, Director of Highways, Olympia, bids to Dec. 23.
- 200 Tons, Downingtown, Pa., power house for the Downingtown Paper Co.
- 175 Tons, State College, Pa., foods building, Pennsylvania State College, Dec. 17.
- 175 Tons, Clark County, Wash., structure over tracks of N. P. Ry., SSH No. 1-T, vicinity of Vancouver Lake, Director of Highways, Olympia, bids to Dec. 23.
- 130 Tons, Mendocino County, Calif., bridge over Rock Creek, 25 miles south of Garberville, California Div. of Highways, Sacramento, bids to Jan. 7.

• • • Reinforcing bar awards this week included the following:

- 1200 Tons, Des Moines, Iowa, water softening plant for City of Des Moines. Previously reported A. H. Neumann Bros., low bidder, to Truscon Steel Co., Cleveland.

600 Tons, Minneapolis, building for Gensen Printing Co. through James Leck, contractor, to U. S. Steel Supply Co., Chicago.

500 Tons, Chicago, 21-story apartment building, H. S. Greenwald, builder, to Patrick Warren Construction Co.

270 Tons, Champaign, Ill., national research building for the University of Illinois through Quehne Simmons to Truscon Steel Co., Cleveland.

200 Tons, Chicago, apartment building at Berwyn and Western Ave. to United Iron & Wire Co.

170 Tons, Spadra, Calif., two ward buildings, Pacific Colony, through Arthur Pinner, Jr., to Bethlehem Pacific Coast Steel Corp., San Francisco.

135 Tons, Redding, Calif., construction of 230-KV transmission lines, Shasta to Cottonwood-Gas Point Road, Bureau of Reclamation, Denver, Spec. 1967, through Abnett Electric Co. to Soule Steel Co., San Francisco.

120 Tons, Stockton, Calif., south sewage treatment plant, through Barrett & Hilp to Soule Steel Co., San Francisco.

• • • Reinforcing bar inquiries this week included the following:

- 8570 Tons, Los Angeles, Los Angeles River improvement, Lankershim Blvd., to Vine-land Ave., Office of District Engineer, Los Angeles, Serial No. W-04-353-eng-48-19, bids to Jan. 5.
- 200 Tons, Chicago, Bond store building. Bids close Dec. 30.
- 140 Tons, Lane County, Ore., section of the S. P. Cascade Line RR. relocation near Dexter, Corps. of Engineers, Portland, Ore., Serial No. 35-026-48-404, bids to Jan. 5.
- 125 Tons, San Bernardino County, Calif., gate structure, Lytle Creek Channel Intake, Office of District Engineer, Los Angeles, Serial No. 48-20, bids to Jan. 8.
- 125 Tons, Clallam County, Wash., road construction and bridges over Sol Duc River, PSH No. 9, Director of Highways, Olympia, bids to Dec. 23.

## Coming Events

Dec. 26-31 American Assn. for the Advancement of Science, annual meeting, Chicago.

1948

Jan. 12-16 Society of Automotive Engineers, annual meeting, Detroit.

Jan. 12-16 National Materials Handling Exposition, Cleveland.

Jan. 19-20 Institute of Scrap Iron & Steel, Inc., annual convention, Chicago.

Jan. 21-24 American Society of Civil Engineers, annual meeting, New York.

Feb. 10-11 Pressed Metal Institute, annual meeting, Buffalo.

Feb. 15-19 American Institute of Mechanical Engineers, annual meeting, New York.

Mar. 3-5 Society of Automotive Engineers, national passenger car meeting, Detroit.

Mar. 15-19 ASTE Industrial Exposition, Cleveland.

Mar. 18-19 Magnesium Assn., annual meeting, New York.

Apr. 5-8 Southern Machinery and Metals Exposition, Atlanta.

Apr. 5-8 National Assn. of Corrosion Engineers, annual conference and exhibition, St. Louis.

Apr. 12-14 Openhearth Steel Committee and Coke Oven, Blast Furnace and Raw Materials Committee, AIME, annual conference, Pittsburgh.

• • • Plate awards this week included the following:

1500 Tons, Worcester, Mass., gas holder, to Stacey Mfg. Co., Cincinnati.

• • • Piling inquiries this week included the following:

320 Tons, Milwaukee, for U. S. Engineers. Bids closed Dec. 9.

• • • Railroad car awards this week included the following:

Denver, Rio Grande & Western R.R. has ordered 500 50-ton general service cars and 50 70-ton 65-ft gondolas from the Pressed Steel Car Co. at McKees Rocks, Pa. The Pressed Steel Car Co. at Mount Vernon, Ohio, has received an order for 200 auto box cars from Pere Marquette R.R. Chicago & Rock Island R. R. has purchased from the government 50 troop sleepers to be converted to blind baggage cars.

## Construction Activity Is Strong for Season

### Washington

• • • Construction activity during November failed to show the usual seasonal decline and actually showed an increase in such fields as home and industrial construction, according to Dept. of Commerce estimates.

Building activity for the month aggregated \$1.25 billion, an increase of nearly a third over the same month a year ago. Total construction for the year has now reached \$11.6 billion.

Totals for private construction for November amounted to \$963 million; home construction, \$525 million; and, industrial building, including warehouses, stores and office buildings, amounted to \$233 million. Farm building slowed by one-half, dropping from \$50 million to \$25 million.

Highway construction totaled \$130 million; railroad, \$121 million; educational, medical and other institutional, \$33 million; and, sanitation construction, \$28 million.

## Foundry Gets Push Buttons

### Boston

• • • Crompton & Knowles Loom Works, Worcester, Mass., are operating the first units of a new cast iron "push button" foundry, 24 squeezer stations.

Features include automatic electric timers, motors and switches, and buttons to open and close compressed air actuated doors releasing prepared sand and other needs. Molds and castings move on electric trains, even through a cooling shed. Air is free of dust and fumes.



## Geneva Convention Gave Maximum Cuts On U.S. Tariff Levels

Washington

••• The following is an IRON AGE compilation of the tariff concessions in the metals field granted by the United States at the 23-nation Geneva conference. It covers all concessions in the field of metals and manufactures of metals as outlined in schedule 3 of the Tariff Act. Concessions take the form of reductions or binding. Where the rate is unchanged the United States agreed to bind it at that level.

Shown are the 1945 rates and the new rates, most of which become effective on Jan. 1, 1948. United States negotiators granted the full 50 pct reduction permitted by law in a majority of the metals and manufactured items.

The new rates apply to all U. S. imports of these products under the most-favored-nation clause. The majority of the concessions in the metals field were made to the following countries: Canada, United Kingdom, Benelux, and France. These countries have already signed the agreement and commodities on which they received concessions will take the new rate on January 1. The other concessions will become effective as soon as other nations put the agreement into effect. In any case, the agreement must become fully effective by June 30, 1948.

The effective dates of the various concessions will be announced by means of Presidential proclamations. The list follows:

Tariff Act 1930; par. No.	Description—Rate
301 Iron in pigs, iron kentrledge:	
	Not more than 0.04 pct phosphorus. Bound at 75¢ ton.
	More than 0.04 pct phosphorus.

# 50 YEARS AGO

THE IRON AGE, December 16, 1897

• "American manufacturers returning from European trips are full of enthusiasm over export possibilities. They find the cost of producing iron and steel in Europe, especially in Great Britain, is so far above the cost in this country that unless some radical change takes place, our people are permanently in the lead in spite of shipping costs to European markets. Reports of heavy output attained by American steel works are received in England with incredulity, or looked upon as Yankee tricks accomplished by doubling up plants."

• "A dispatch from Cripple Creek, Col., reports that the northern boundary of the Cripple Creek gold district has been extended three miles by the discovery on Copper mountain of a large blanket vein of ore running from \$10 to \$1500 per ton in gold."

• "Secretary of the Treasury Gage concludes his annual report with some very sound observations on the nature of a bank currency, in which he shows his perfect accord with the best and practically the unanimous financial sentiment. 'Paper money is the product of an industrial, commercial and financial evolution. Credit is the base upon which it rests.'"

• "The National Association of Manufacturers has made plans for establishment of a warehouse at Caracas, Venezuela, for the purpose of displaying samples of American goods."

• "After a good deal of missionary work and what appeared to be a strange hesitation in adopting modern coking methods, improvement in that direction is now under way."

## make blade selection



## a cinch

## not a search!



## use the new VICTOR WALL CHART

You'll see the name of the blade you want to use—hand, power or band saw—opposite the type of material you want to cut. You'll see this valuable information quickly, easily, when you tack the new Victor wall chart over your tool crib or in your machine shop.

What's more you'll get a lot of inside tips on how to get longer life, the best use, from every blade... There are plenty of ways to cut costs, make money, on this new Victor Wall Chart... It's printed clearly, attractively, and it's yours absolutely FREE.

Drop in on your Victor supplier—or send him a card, today. *The supply is limited.* Also see him the next time you want the finest in cutting performance. He carries a full line of Victor blades—one for every job a hack saw or a band saw can do. Victor blades cut better, too, on metals, plastics, and other non-metallics... cut faster, cleaner, last longer.

**VICTOR** SAW WORKS, INC.  
MIDDLETOWN, N. Y., U. S. A.  
3708



270-ft. rotary kiln at Anaconda, Montana

# Anaconda MANGANESE NODULES

## AVERAGE ANALYSIS

Mn	60%
SiO <sub>2</sub>	8%
Al <sub>2</sub> O <sub>3</sub>	0.76%
Fe	3.1%
P	0.06%

46391


**ANACONDA COPPER MINING COMPANY**

Offices: 25 Broadway, New York 4, N. Y.

Anaconda, Montana

**Tariff Act**

1930; par. No.

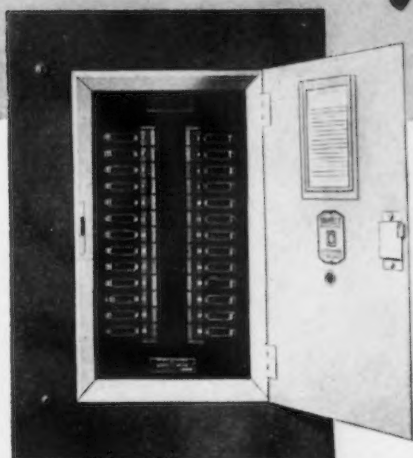
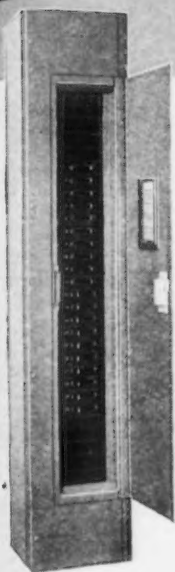
Description—Rate

- Old rate \$1.125 ton; new rate 75¢ ton.
- 301 Spiegeleisen, over 1 pct carbon:  
Bound at 75¢ ton.
- 301 Wrought iron and cast scrap, scrap steel:  
Old rate 75¢ ton; new rate 37½¢ ton.
- Additional duty as follows:  
On vanadium content over 0.1 pct.  
Old rate \$1 lb; new rate 50¢ lb.  
On tungsten content over 0.2 pct.  
Old rate 72¢ lb; new rate 50¢ lb.  
On molybdenum content over 0.2 pct.  
Bound at 65¢ lb.  
On chromium content over 0.2 pct.  
Old rate 3¢ lb; new rate 1½¢ lb.
- 302 (a) Manganese ore (including ferruginous) or concentrates, and man-  
ganiferous iron ore, all containing over  
10 pct metallic manganese. Metal con-  
tent:  
Old rate ½¢ lb; new rate ¼¢ lb.
- 302 (c) Tungsten ore and concentrates:  
Metal content:  
Old rate 50¢ lb; new rate 38¢ lb.
- 302 (d) Ferromanganese:  
Over 1 pct-less than 4 pct carbon:  
Metal content:  
Old rate 1⅞¢ lb; new rate 15/16¢ lb.  
Over 4 pct carbon, Metal content:  
Old rate 1¢ lb; new rate 11/16¢ lb.
- 302 (e) Manganese silicon containing  
over 45 pct manganese:  
Old rate 1⅞¢ lb contained manganese  
and 15 pct ad valorem; new rate  
1¢ lb on contained manganese and  
10 pct ad valorem.
- 302 (e) Ferromanganese, not more than  
1 pct carbon:  
Old rate 1⅞¢ lb contained manganese  
and 15 pct ad valorem; new rate  
15/16¢ lb contained manganese and  
10 pct ad valorem.
- 302 (g) Tungsten metal, tungsten car-  
bide, and mixtures or combinations  
containing tungsten metal or tungsten  
carbide, all in lumps, grains or powder:  
Old rate 50 pct ad valorem, new rate  
42¢ lb contained tungsten and 25  
pct ad valorem.
- 302 (g) Tungstic acid, and all com-  
pounds of tungsten not specially pro-  
vided for:  
Old rate 60¢ lb contained tungsten  
and 40 pct ad valorem; new rate  
42¢ lb contained tungsten and 20  
pct ad valorem.
- 302 (h) Ferrotungsten, ferrochromium  
tungsten, chromium tungsten, chrom-  
ium cobalt tungsten, tungsten nickel  
and all other alloys of tungsten not  
specially provided for:  
Old rate 25 pct ad valorem; new  
rate 42¢ lb contained tungsten and  
12½ pct ad valorem.
- 302 (i) Ferrosilicon:  
8 to 30 pct silicon:  
Old rate 1¢ lb contained silicon;  
New rate 1¢ lb contained silicon.  
30 to 60 pct silicon:  
Old rate 2¢ lb contained silicon;  
new rate 1½¢ lb contained silicon.  
60 to 80 pct silicon:  
Old rate 3¢ lb contained silicon; new  
rate 2¢ lb contained silicon.  
80 to 90 pct silicon:  
Old rate 4¢ lb on silicon content;  
new rate 2½¢ lb on silicon content.  
90 pct or more silicon:  
Old rate 8¢ lb on silicon content;



# NEW LOW COST

## NQB CIRCUIT BREAKER PANELBOARDS FOR A.C. SYSTEMS



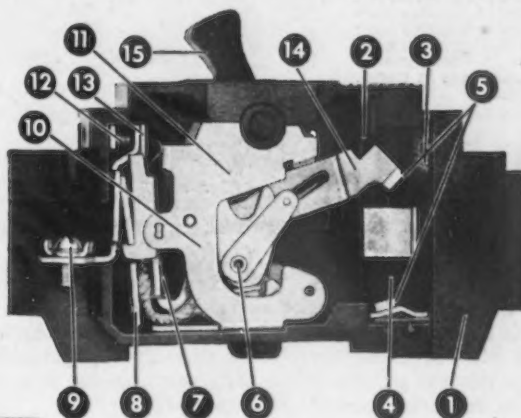
NQB lighting panelboards, using the new ML A.C. breakers are available in double-row, single-pole breakers up to 42 circuits; also in single-row, column-type up to 32 circuits.

FEATURING

**QUICK** { TRIP  
MAKE  
BREAK  
*Coilless*  
THERMAL - MAGNETIC  
CIRCUIT BREAKERS



TYPE ML A.C. Single Pole Breakers, Form Q  
15 to 50 Amperes for Alternating Current Systems



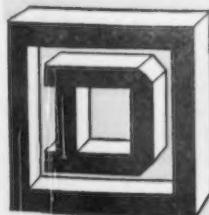
### ML A.C. BREAKER FEATURES

- |   |   |
|---|---|
| 1 Mechanism is completely enclosed in a sealed, compact, molded bakelite case to prevent tampering and for maximum safety | 8 Coilless magnetic-trip element  |
| 2 Narrow slot for edgewise-contact arm isolates arc chamber   | 9 Load terminal   |
| 3 Arc-chamber vent screen   | 10 Main spring (concealed) provides positive contact pressure and strong mechanism action |
| 4 Arc-suppressor chamber  | 11 All steel parts are rust-proofed to prevent corrosion                                  |
| 5 Silver tungsten contacts brazed to contact arms and plates  | 12 Bimetal adjustment screw (sealed)  |
| 6 Bearing surfaces are hardened to reduce wear  | 13 Bimetal for delayed trip   |
| 7 Stainless steel sensitive latch   | 14 Solid, high strength, high conductivity cadmium copper edgewise contact bar            |
|   | 15 Strong cross-section molded bakelite handle  |

### PANELBOARD FEATURES

- Meets Federal Specification WP131A for Class 1 breakers.
- Standard panelboards are made with flush or surface trims.
- Narrow type panels for mounting in web of structural steel columns have surface front with hinged door... can be furnished with special extension wiring channels.

Write for information on NQB Panelboards.  
Square D Company, 6060 Rivard Street, Detroit 11, Michigan.



## SQUARE D COMPANY

DETROIT

MILWAUKEE

LOS ANGELES

SQUARE D CANADA, LTD., TORONTO, ONTARIO • SQUARE D de MEXICO, S.A., MEXICO CITY, D.F.

# 2 STEPS in Cutting Costs of Handling Bagged Material

1

## Install BAKER Fork Truck and Pallets

This will eliminate the back-breaking labor of handling individual bags manually, cut time and cost of car-loading or unloading, add storage space by tiering, and speed inter-department handling.

2

## Get Suppliers to Palletize Shipments

This will cut time and cost of unloading incoming material. Supplier will make corresponding savings at shipping end with Fork Truck-Pallet combination. Damage in transit minimized.



Baker Fork Truck tiering pallet loads of bagged starch in storage. Note method of "locking" sacks to prevent side-slipping.

AT THE ERIE, PA. PLANT of one of our customers, raw materials such as clay, starch and talc, are received in bags. A typical carload will contain some 1600 bags, weighing about 50 lbs. each. These bags must be unloaded, stored, and transported to process departments as required.

This company took Step No. 1 years ago, and from the receiving point all bagged materials are carried in unit loads on pallets by fork truck. This has resulted in substantial savings each time the material is handled and has increased warehouse capacity by permitting high tiering. But bags not on pallets when they arrive must first be palletized—an operation requiring about 14 hours per car.

Step No. 2 is now under way. Arrangements are being made with all suppliers of bagged materials, to ship in unit loads, on pallets. Such carloads can be completely unloaded and stored in not much over two hours—as against 14 hours for palletizing alone. Since no individual man-handling of bags is required, heavy labor is eliminated, and damage from handling and shipping is minimized. Comparable savings are realized by suppliers at the shipping end, making it possible to improve deliveries.

Savings possible by complete palletization are demonstrated at the same plant in the case of shipping cartons. For these, which arrive in "knock-down" condition, the company furnishes the supplier with special four-way pallets—and the "flats" arrive in unit loads strapped to these pallets. Unloading and warehousing now takes about three hours per car, where formerly, when "flats" were received unpalletized, it took 24 man-hours for the job.

*Let a Baker Material Handling Engineer show you how you can save money with fork trucks and pallets.*

See us at Booth 303  
Materials Handling Exposition  
CLEVELAND—JANUARY 12-16

BAKER INDUSTRIAL TRUCK DIVISION  
of The Baker-Raulang Company  
2175 West 25th Street • Cleveland, Ohio  
In Canada: Railway & Power Engineering Corp., Ltd.

# Baker INDUSTRIAL TRUCKS

### Tariff Act

1930; par. No.

Description—Rate

- new rate 4¢ lb on silicon content.
- 302 (k) Ferrochrome or ferrochromium containing 3 pct or more carbon:  
Old rate 1¼¢ lb on chromium content; new rate ¾¢ lb on chromium content.
- 302 (k) Chrome metal or chromium metal:  
Old rate 25 pct ad valorem; new rate 25 pct ad valorem.
- 302 (l) Boron carbide:  
Old rate 12½ pct ad valorem; new rate 6¼ pct ad valorem.
- 302 (m) Ferrotitanium, ferrovanadium and ferroureanum:  
Old rate 15 pct ad valorem; new rate 12½ pct ad valorem.
- 302 (n) Columbium or niobium, tantalum, alloys of one of these metals with the other, and alloys of columbium or niobium, or tantalum, or both, with one or more of the metals barium, boron, calcium, strontium, thorium, titanium, uranium, vanadium, or zirconium:  
Old rate 25 pct ad valorem; new rate 12½ pct ad valorem.
- 302 (o) All alloys used in the manufacture of steel or iron, not specially provided for:  
Old rate 25 pct ad valorem; new rate 12½ pct ad valorem.
- 303 Muck bars, pieces thereof except crop ends, bar iron, and round iron in coils or rods, iron in slabs, blooms, loops or other forms less finished than iron in bars and more advanced than pig iron, except castings; all the foregoing:  
Valued not above 1½¢ lb:  
Old rate ¼¢ lb; new rate ⅓¢ lb.  
Valued above 1½¢ and not above 2½¢ lb:  
Old rate .50¢ lb; new rate ¼¢ lb.
- 304 Steel ingots, cogged ingots, blooms and slabs, by whatever process made:  
Valued not above 1½¢ lb:  
Old rate ¼¢ lb; new rate ⅓¢ lb.  
Valued above 1½¢ and not above 2½¢ lb:  
Old rate ¾¢ lb; new rate \$/16¢ lb.  
Valued above 2½¢ and not above 5¢ lb:  
Old rate 20 pct ad valorem; new rate 10 pct ad valorem.  
Valued above 16¢ lb:  
Old rate 20 pct ad valorem; new rate 15 pct ad valorem.
- 304 Die blocks or blanks; shafting; pressed, sheared or stamped shapes, not advanced in value or condition by any process or operation subsequent to the process of stamping; hammer molds or swaged steel; gunbarrel molds not in bars; concrete reinforcement bars; all descriptions and shapes of dry sand, loam, or iron molded steel castings; sheets and plates and steel not specially provided for; all the foregoing:  
Valued not above 1½¢ lb:  
Old rate ¼¢ lb; new rate ⅓¢ lb.  
Valued above 1½¢ and not above 2½¢ lb:  
Old rate 2/5¢ lb; new rate 1/5¢ lb.  
Valued above 2½¢ and not above 5¢ lb:  
Old rate 20 pct ad valorem; new rate 10 pct ad valorem.  
Valued above 16¢ lb:  
Old rate 20 pct ad valorem; new rate 15 pct ad valorem.
- 304 Additional duty on all steel circular





**Y**OUR steel requirements can best be served by a progressive, superbly staffed, completely integrated steel producer. WISCONSIN is exactly that.

*Progressive* is more than a word at WISCONSIN. It's a *fact* that has been demonstrated by our development of Sulfite-Treated Steel—the highly machinable steel that overcomes the faults of re-sulphurized steels. "H" steels of guaranteed hardenability are a specialty of ours. Both of these steels are earning wide acceptance and acclaim.

*Superbly Staffed* by top-flight steelmen, WISCONSIN has one prime objective: to make the best possible steel for our customers. Every man in the mill works toward that goal.

*An Integrated Organization* gives WISCONSIN complete control of the product from the ore mines to the customer. That control means finer steel.

Watch WISCONSIN for steel progress. We can't supply all the steel our customers need but the picture is improving. We haven't compromised with quality. Our sales and metallurgical staffs are ready to serve you.

#### **WISCONSIN STEEL OPERATIONS**

Ore Mines • Coal Mines • Ore Freighters  
Blast Furnaces • Open Hearth Furnaces • Rolling Mills  
Heat-Treating, Cold Finishing and Annealing Facilities

### **WISCONSIN STEEL COMPANY**

(Affiliate of International Harvester Company)

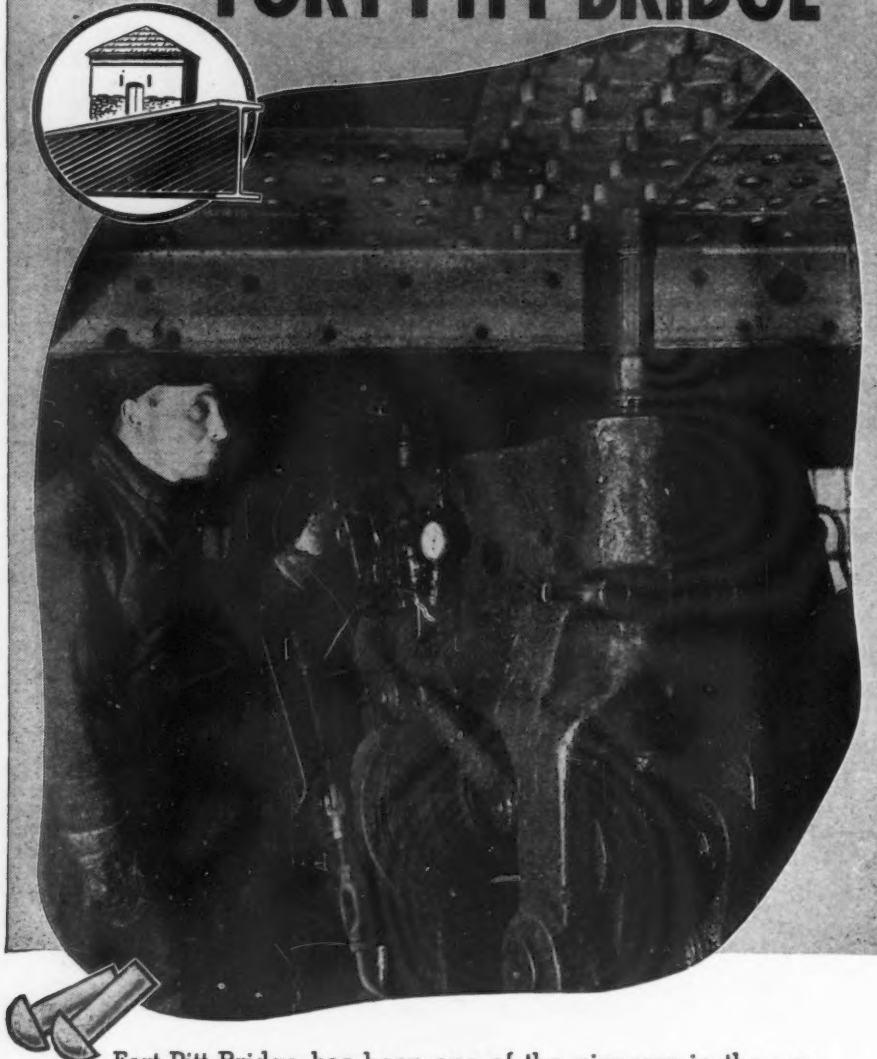
180 North Michigan Avenue

Chicago 1, Illinois

# **WISCONSIN STEEL**

# Cold RIVETING

... another important facility at  
**FORT PITT BRIDGE**



Fort Pitt Bridge has been one of the pioneers in the use of Cold Riveting to improve the quality of certain types of construction. Modern equipment, long experience and unexcelled facilities make Fort Pitt Bridge your logical headquarters for the BEST in conventional hot and cold riveting.

*"Steel Permits Streamlining Construction  
with Safety, Endurance and Economy"*

## FORT PITT BRIDGE WORKS

Member American Institute of Steel Construction

General Offices, PITTSBURGH, PA.

Plant at CANONSURG, PA.

### BRANCH OFFICES

New York, N. Y. 441 Lexington Avenue    Columbus, Ohio    Huntington Bank Bldg.  
Cleveland, Ohio    Bulkley Building    Detroit, Michigan    New Center Bldg.  
Philadelphia, Pa.    Commercial Trust Bldg.

### Tariff Act

1930; par. No.

Description—Rate

saw plates under the first proviso to paragraph 304, Tariff Act of 1930, shall be:

Old rate  $\frac{3}{4}$ ¢ lb; new rate  $\frac{3}{4}$ ¢ lb.  
304 Billets and bars, solid or hollow (except hollow bars and hollow drill steel valued above 4¢ lb):

Valued at not above  $1\frac{1}{2}$ ¢ lb:

Old rate  $\frac{3}{4}$ ¢ lb; new rate  $\frac{3}{4}$ ¢ lb.

Valued above  $1\frac{1}{2}$  and not above  $2\frac{1}{2}$ ¢ lb:

Weighting not more than 30 lb per linear ft:

Old rate  $\frac{2}{5}$ ¢ lb; new rate  $\frac{1}{5}$ ¢ lb.

Weighting more than 30 lb per linear ft:

Old rate  $\frac{3}{8}$ ¢ lb; new rate  $\frac{3}{16}$ ¢ lb.

Valued above  $2\frac{1}{2}$  and not above 5¢ lb:

Old rate 20 pct ad valorem; new rate 10 pct ad valorem.

Valued above 16¢ lb:

Old rate 20 pct ad valorem; new rate 15 pct ad valorem.

304 Hollow bars and hollow drill steel: Valued above 4 and not above 5¢ lb:

Old rate  $\frac{3}{4}$ ¢ lb and 20 pct ad valorem; new rate  $\frac{3}{4}$ ¢ lb and 10 pct ad valorem.

Valued above 5 and not above 8¢ lb:

Old rate  $\frac{3}{4}$ ¢ lb and 20 pct ad valorem; new rate  $\frac{3}{4}$ ¢ lb and 20 pct ad valorem.

Valued above 8 and not above 12¢ lb:

Old rate 20 pct ad valorem but not less than  $1\frac{1}{8}$ ¢ lb; new rate 10 pct ad valorem but not less than  $\frac{3}{8}$ ¢ lb.

Valued above 12 and not above 16¢ lb:

Old rate  $4\frac{1}{4}$ ¢ lb; new rate 3¢ lb.

Valued above 16¢ lb:

Old rate  $\frac{3}{4}$ ¢ lb and 20 pct ad valorem; new rate  $\frac{3}{4}$ ¢ lb and 15 pct ad valorem.

Provided That no hollow bars and hollow drill steel provided for in this item shall be subject to a separate additional duty under the second proviso to paragraph 304, Tariff Act of 1930.

305 (1) and (2) The additional duties to be levied, collected, and paid under paragraph 305, Tariff Act of 1930, on all steel or iron in the materials and articles enumerated or described in paragraphs 303, 304, 307, 308, 312, 313, 315, 316, 317, 318, 319, 322, 323, 324, 327 and 328, Tariff Act of 1930, shall be as follows:

If such steel or iron contains more than  $\frac{1}{10}$  of 1 pct of vanadium, or more than  $\frac{2}{10}$  of 1 pct of tungsten, molybdenum, or chromium, or more than  $\frac{6}{10}$  of 1 pct of nickel, cobalt, or any other metallic element used in alloying steel or iron:

Old rate 4 pct ad valorem, and; new rate 4 pct ad valorem, and an additional cumulative duty:

On the vanadium content in excess of  $\frac{1}{10}$  of 1 pct:

Old rate \$1 lb; new rate 50¢ lb.

On tungsten content in excess of  $\frac{2}{10}$  of 1 pct:

Old rate \$1 lb; new rate 50¢ lb.

On molybdenum content in excess of  $\frac{2}{10}$  of 1 pct:

Old rate 72¢ lb; new rate 65¢ lb.

On chromium content in excess of



# HIGH PRODUCTION PRESSES FOR GREATER VOLUME PRODUCTION

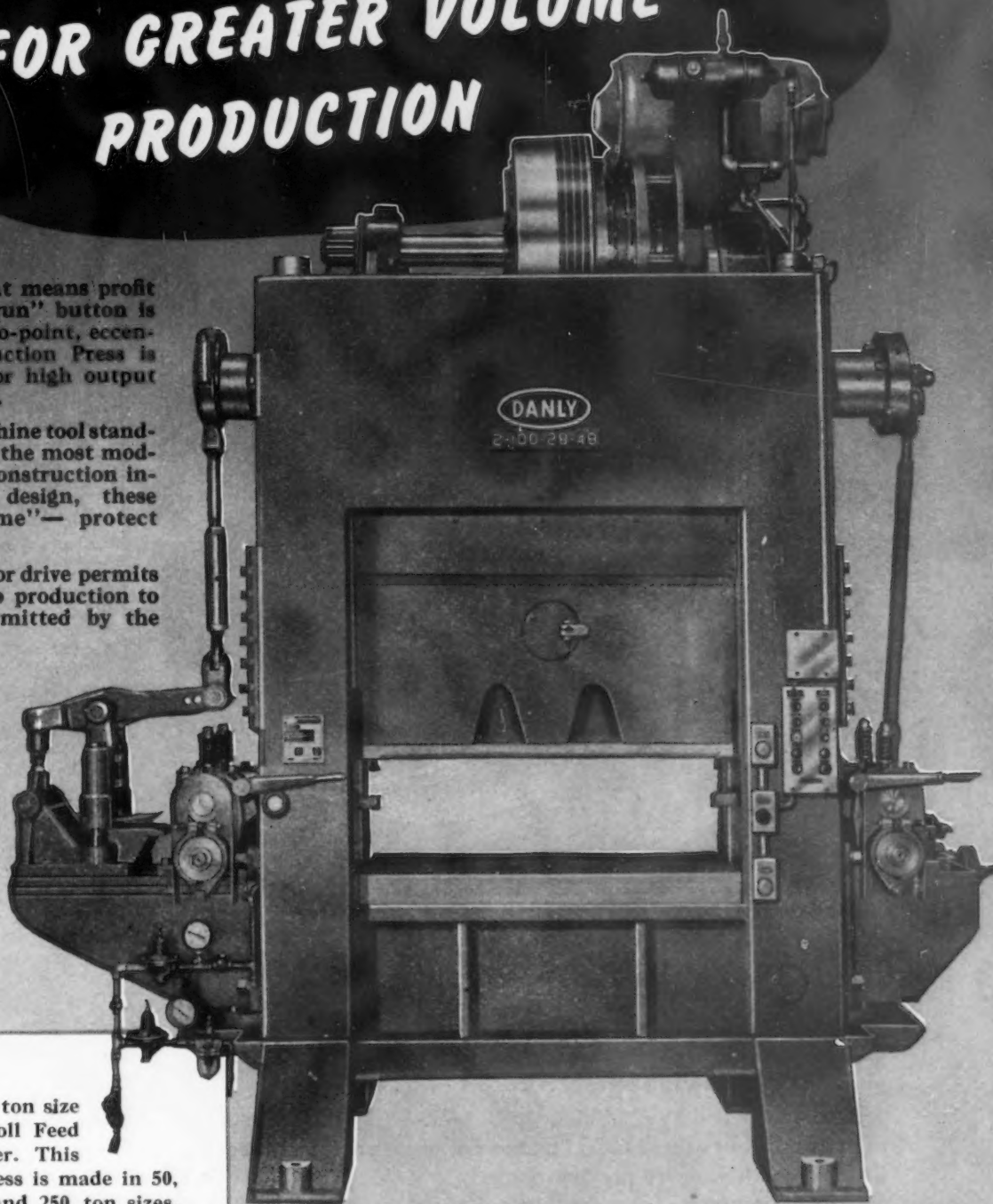
HERE is a press that means profit every time the "run" button is pushed. This Danly two-point, eccentric gear, High Production Press is specifically designed for high output of strip up to  $\frac{1}{4}$ " thick.

Sturdily built to machine tool standards of precision, with the most modern features of press construction incorporated in their design, these presses cut "downtime"—protect costly dies.

A variable speed motor drive permits the operator to step up production to the highest speed permitted by the material being stamped.

Compare the features and construction of this line of presses against those of their type with which you are now familiar. Danly's Press Division will be glad to supply more complete information upon request.

Shown is the 100 ton size equipped with Roll Feed and Scrap Cutter. This type of Danly Press is made in 50, 75, 100, 150, 200 and 250 ton sizes. Send inquiries for your requirements to Danly.



## Check and Compare These Features

\*Two slide connections for accurate alignment.

\*Fully enclosed construction (all weldments thoroughly stress relieved before machining).

\*Circulating filtered oil pressure lubrication system. Pressure pump so arranged that press is inoperable until oil pressure builds to operating pressure.

\*Variable speed motor drive

(50-100 strokes per minute).

\*Danly Improved Air-Friction Clutch.

\*Flywheel shaft mounted on anti-friction bearings retained in removable pillow blocks provides easy accessibility for maintenance.

\*Eccentric Gears, connections and gibs—bronze lined.

# DANLY

MACHINE SPECIALTIES, INC.

2100 S. 52nd Avenue, Chicago 50, Ill.

## THE PRESS FOR MODERN PRODUCTION

There's a  
**LIONITE Abrasive**  
 FOR  
*Every Polishing Job*



LIONITE aluminum oxide abrasives are made in a wide range of types and sizes to meet the many and varied demands of the polishing trade. A product of the electric furnace, LIONITE grains are noted for their uniformity from lot to lot, and their ability to stand up in severe service.

Actual tests run by users show important savings in a variety of polishing jobs when LIONITE abrasive grains are substituted for a competitive grain previously used.

CBT LIONITE is recommended for wheels set up with glue. NB LIONITE works best with cement. Ask to have a LIONITE representative survey your polishing operation.

**GENERAL ABRASIVE COMPANY, INC.**



Lionite and Carbonite Abrasive Grains

NIAGARA FALLS, NEW YORK, U. S. A.

**Tariff Act  
 1930; par. No. Description—Rate**

2/10 of 1 pct:  
 Old rate 3¢ lb; new rate 1½¢ lb.

307 Boiler or other plate iron or steel, except crucible plate steel and saw plate steel, not thinner than .109 in. cut or sheared to shape or otherwise, or unsheared, and skelp iron or steel, sheared or rolled in grooves; all the foregoing regardless of value:

Old rate 0.35¢ lb or 20 pct ad valorem; new rate 10 pct ad valorem but not less than 0.175¢ lb.

308 Sheets of iron or steel, common or black, of whatever dimensions, and skelp iron or steel:

Valued at 3¢ lb or less:

Thinner than .109 in. and not thinner than .038 in.:

Old rate 0.35¢ lb; new rate 10 pct ad valorem but not less than 0.175¢ lb.

Thinner than .038 in. and not thinner than .022 in.:

Old rate 0.45¢ lb; new rate 10 pct ad valorem but not less than .225¢ lb.

Thinner than .022 in. and not thinner than .010 in.:

Old rate 0.60¢ lb; new rate 0.30¢ lb.

Thinner than .010 in.:

Old rate 0.70¢ lb; new rate 0.35¢ lb.

Corrugated or crimped:

Old rate 0.60¢ lb; new rate 0.30¢ lb.

Valued at more than 3¢ lb:

Old rate 20 pct ad valorem; new rate 10 pct ad valorem.

309 All iron or steel sheets, plates, bars, and rods, and all hoop, band, or scroll iron or steel, excepting what are known commercially as tin plates, terneplates, and taggers tin, when galvanized or coated with zinc, spelter, or other metals, or any alloy of those metals, shall be subject to:

Old rate 0.20¢ lb additional; new rate 0.10¢ more duty than if the same was not so galvanized or coated.

309. Plates or sheets of iron or steel, by whatever name designated, other than polished, planished, or glanced, which have been pickled or cleaned by acid, or by any other material or process, or which are cold-rolled, smoothed only, not polished, shall be subject to:

Old rate 0.20¢ lb additional, new rate 0.10¢ lb more duty than rates provided on corresponding thicknesses of common or black sheet iron or steel.

310 Sheets or plates of iron or steel, or taggers iron or steel, coated with tin or lead, or with a mixture of which these metals, or either of them, is a component part, by the dipping or any other process, and commercially known as tin plates, terneplates, and taggers tin:

Old rate 1¢ lb; new rate 1¢ lb.

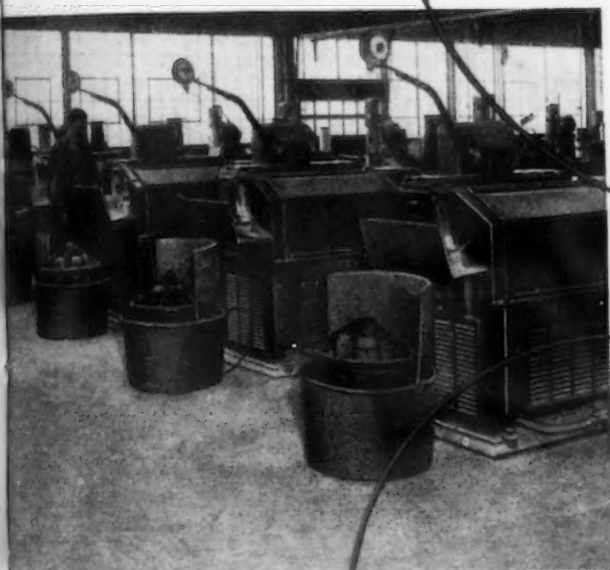
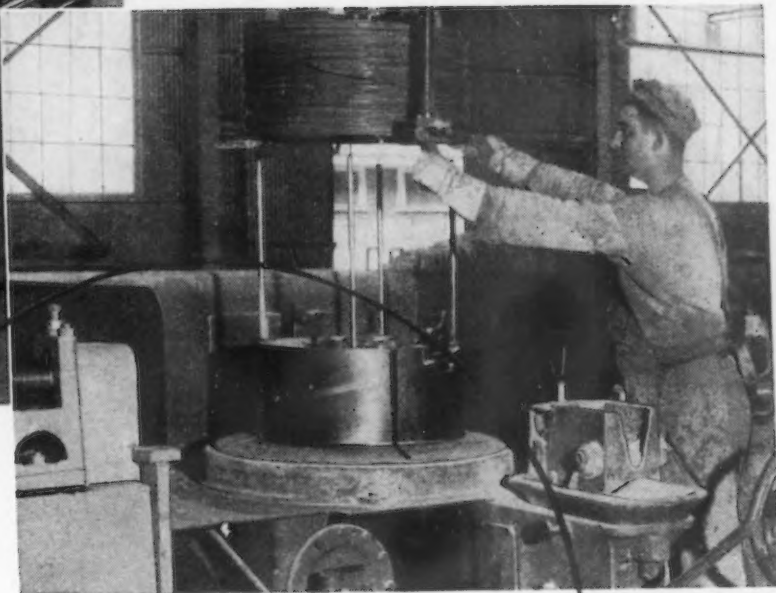
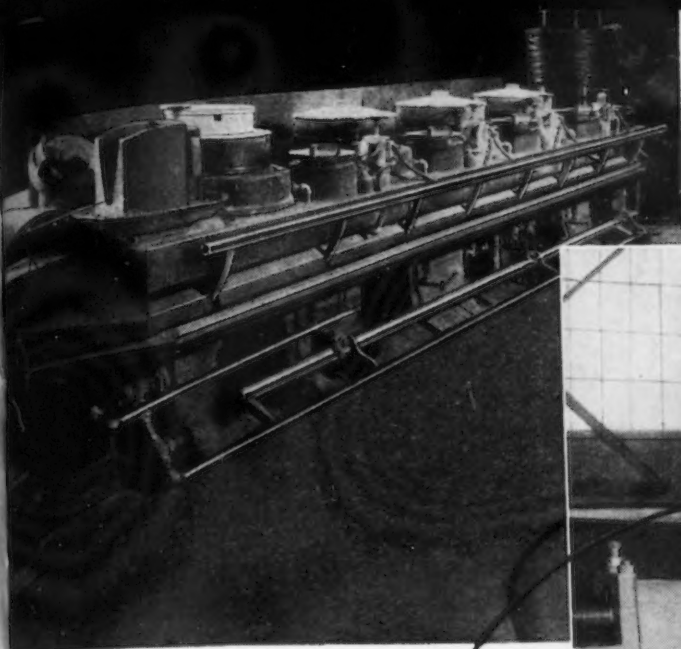
312 Beams, girders, joists, angles, channels, car-truck channels, tees, columns and posts, or parts or sections of columns and posts and deck and bulb beams, together with all other structural shapes of iron or steel:

Not assembled, manufactured or advanced beyond hammering, rolling or casting:

Old rate 1/5¢ lb; new rate 3/8¢ lb.

Machined, drilled, punched, assembled, fitted, fabricated for use, or otherwise advanced beyond hammering.





*Quick on the Draw!*

# Vaughn

**Speed in Operation  
Saves Production Time**

## Cold Drawing Machinery

Vaughn Machinery's speed and adaptability make a significant difference in cold drawn quality and output—enable long-term reductions in operating costs. Let us quote on your current cold drawing equipment requirements!

**THE VAUGHN MACHINERY COMPANY**  
CUYAHOGA FALLS, OHIO, U. S. A.

COMPLETE COLD DRAWING EQUIPMENT . . . Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys.



**VAUGHN MACHINERY**

PROFITABLY USED BY LEADING

PRODUCERS SINCE 1871

# SAVE SUPERVISION in fitting PRECISION PARTS



YOU PROBABLY KNOW Laminum shims as assembly time savers. But have you overlooked the fact that in fitting machine parts by peeling these precision laminations, considerably less supervision is required. You have the certainty of uniform accuracy... with no spoilage. Your request for data invited.

*Laminum shims are cut to your specifications. For maintenance work, however, shim materials are sold through industrial distributors.*

Laminated Shim Company, Incorporated  
76 Union Street Glenbrook, Conn.

## LAMINUM

THE SOLID SHIM THAT *peels* FOR ADJUSTMENT

2221

124—THE IRON AGE, December 18, 1947

### NEWS OF INDUSTRY

Tariff Act 1930; par. No.	Description—Rate
	rolling, or casting: Old rate 15 ad valorem; new rate 10 pct ad valorem.
312	Sashes and frames of iron or steel: Old rate 15 pct ad valorem; new rate 15 pct ad valorem.
313	Hoop, band, and scroll iron or steel, not specially provided for, valued at 3¢ lb or less, 8 in. or less in width: Thinner than ⅜ in. and not thinner than .109 in.: Old rate ¼¢ lb; new rate 3/20¢ lb. Thinner than .109 in. and not thinner than .038 in.: Old rate 35/100¢ lb; new rate 1/5¢ lb. Thinner than .038 in.: Old rate .55¢ lb; new rate .30¢ lb.
313	Bands and strips of iron or steel, whether long or short lengths, not specially provided for: Old rate 25 pct ad valorem; new rate 15 pct ad valorem.
314	Hoop or band iron, and hoop or band steel, cut to lengths, or wholly or partly manufactured into hoops or ties, coated or not coated with paint or any other preparation, with or without buckles or fastenings, for baling cotton or any other commodity: Old rate 1/5¢ lb; new rate 3/20¢ lb.
315	Wire rods: Rivet, screw, fence, and other iron or steel wire rods, whether round, oval, square, or in any other shape, nail rods and flat rods up to 6 in. width ready to be drawn or rolled into wire or strips, all the foregoing in coils or otherwise, valued at not over 2½¢ lb: Old rate ¼¢ lb; new rate ⅓¢ lb.
316 (a)	Round iron or steel wire, valued at not above 6¢ lb: Not smaller than .095 in. diam: Old rate ¾¢ lb; new rate ⅝¢ lb. Smaller than .095 and not smaller than .065 in. diam: Old rate 1¼¢ lb; new rate ⅞¢ lb. Smaller than .065 in. diam: Old rate 1½¢ lb; new rate ¾¢ lb. Any of the foregoing coated by dipping, galvanizing, sherardizing, electrolytic, or any other process with zinc, tin, or other metal. Old rate 2/10¢ lb additional; new rate 1/10¢ lb additional.
316 (a)	All wire composed of iron, steel, or other metal, not specially provided for (except gold, silver, platinum, tungsten or molybdenum). Old rate 25 pct ad valorem and 4¢ lb copper content; new rate 15 pct ad valorem and 2¢ lb copper content.
316 (a)	Telegraph, telephone, and other wires and cables composed of iron, steel or other metal (except gold, silver, platinum tungsten or molybdenum) covered with or composed in part of cotton, jute, silk, enamel, lacquer, rubber, paper, compound or other material, with or without metal covering: Old rate 35 pct ad valorem and 4¢ lb; new rate 17½ pct ad valorem and 2¢ lb. NOTE: The U. S. reserves the right to withdraw, upon giving 30 days' notice in writing to the contracting parties that such action is necessary in connection with measures permissible under this Agreement to encourage the production or use of synthetic rubber in the U. S., the application of items 316(a), 320, 369(c), 370,



# ARE YOU ASKING THESE QUESTIONS?

Answer them with PERMANENTE 84!



**"Anybody can reduce burn-in time ... but can I increase ingot output?"**

17 to 18 hour burn-in time with Permanente 84! Made firm with an air set bond, bottoms of Permanente 84 pericase ramming material are ready for long-lasting action in *hours*. And ...

More ingot production with Permanente 84! Temperatures can be raised to cut meltdown time with perfect safety. Failure of Permanente 84 under 25 p.s.i. comes only at 3000°F



**"Can I cut down refractory shrinkage?"**

Almost no refractory shrinkage with Permanente 84! Linear shrinkage has been proved less than 1%, volume shrinkage less than 5%, after firing to 3000°F during nine-hour tests!



**"Can I get a solid refractory bottom?"**

Deep ceramic bond with Permanente 84! Its amazing new bond reacts with magnesium oxide at 2200°F to form highly refractory crystalline minerals which stabilize the mass, resist shrinkage, and load to high temperatures. It is a thermal, chemical set, rather than a slagging action. No fluids!

Permanente 84 is made of accurately sized, pre-shrunk pericase grains of low porosity, fired to more than 3100°F. Its pericase, refined from sea water, has higher purity than mined magnesite.

Its unusually low lime and high magnesia con-

tent make it extremely resistant to hydration, to iron oxide penetration and to slag wash.

Learn more about how Permanente 84 can help increase *your* ingot tonnage at less cost per ton! Call a Permanente 84 engineer *today*.

# PERMANENTE 84

**PERICLASE RAMMING MATERIAL**

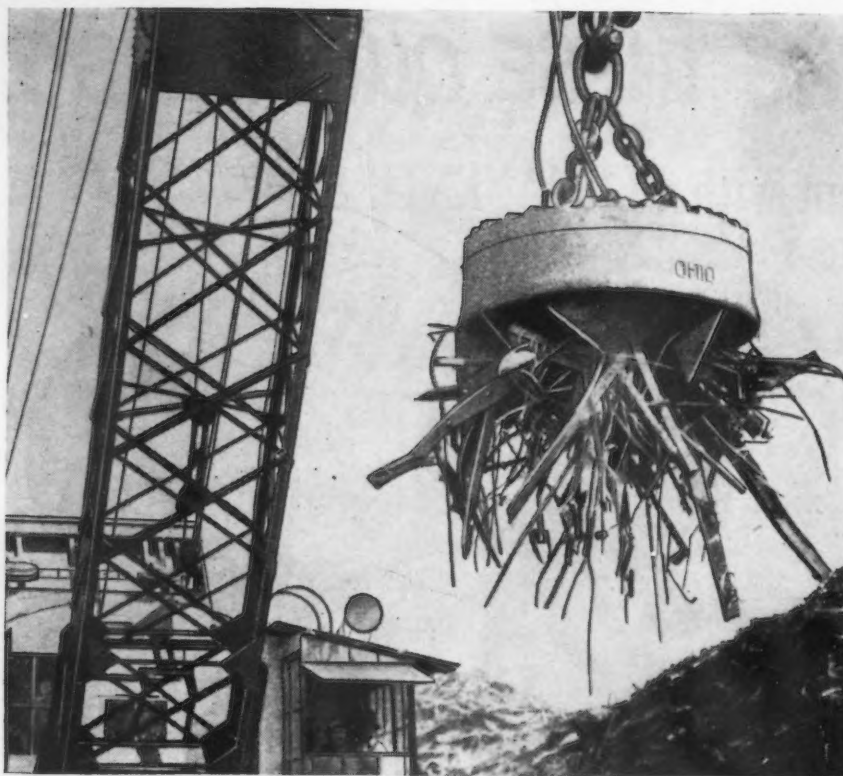
PERMANENTE PRODUCTS COMPANY, CHEMICAL DIVISION, KAISER BUILDING, OAKLAND 12, CALIFORNIA

*For immediate delivery in the East, call or write:*

PERMANENTE PRODUCTS COMPANY  
1712 First Central Tower Bldg., Akron 8, Ohio. BLackstone 5518

*For immediate delivery in the West, call or write:*

PERMANENTE PRODUCTS COMPANY  
1924 Broadway, Oakland 12, Calif. TWinoaks 3-4600



## Hands off!

One lift, one swing, one drop.

Magnetic materials handling moves scrap *directly* to where you want it—in magnet-minutes instead of manhours.

The magnet you invest in determines *how much faster* scrap can be moved. Just as there is a difference in the physical strength of men, there is also a difference in the electrical strength of magnets.

A small 20 inch Ohio Magnet, however, easily lifts more than 200 pounds of high grade scrap. Our larger 65 inch magnet attracts and holds more than 6200 pounds of the same grade of scrap.

Ohio Electric makes 14 different sizes of circular magnets. Fitting the right size magnet to your specific needs doesn't take much time—but *it does take experience.*

Some of our customers frequently say they prefer Ohio Magnets because Ohio chain

ears have square holes for chain pins to eliminate friction and prolong life. Others especially like the Ohio Armored Weatherproof Connector with insulated iron shell and bayonet joint. It withstands smashing blows and saves time when making or breaking connections.

Find out now how much you can reduce scrap handling costs. Write to Ohio: for 25 years a leader in magnetic materials handling.



also a leading name in  
the small motor field

### THE OHIO ELECTRIC MFG. CO.

5908 MAURICE AVE. • CLEVELAND 4, OHIO

## NEWS OF INDUSTRY

### Tariff Act

1930; par. No.

Description—Rate

- 913(a), 923, 1537(b) and 1604 of this Part to articles composed wholly or in part of India rubber.
- 316 (a) Wire rope:  
Old rate 2½¢ lb but not less than 17½ or more than 35 pct ad valorem; new rate 1¼¢ lb but not less than 10 or more than 20 pct ad valorem.
- 316 (a) Wire strand:  
Old rate 35 pct ad valorem; new rate 17½ pct ad valorem.
- 316 (b) Ingots, shot bars, sheets, wire, or other forms, not specially provided for, or scrap, containing more than 50 pct of tungsten, tungsten carbide, molybdenum, or molybdenum carbide, or combinations thereof:  
Ingots, shot bars, or scrap:  
Old rate 50 pct ad valorem; new rate 30 pct ad valorem.  
Sheets, wire, other forms:  
Old rate 60 pct ad valorem; new rate 40 pct ad valorem.
- 317 All galvanized wire not specially provided for, not larger than .2 or smaller than .08 in. diam, of the kind commonly used for fencing purposes, galvanized wire fencing composed of wires not larger than .2 or smaller than .08 in. diam; and all wire commonly used for baling hay or other commodities:  
Old rate ½¢ lb; new rate ¼¢ lb.
- 318 Woven-wire cloth: Gauze, fabric, screen made of wire composed of steel, brass, copper, bronze, or any other metal or alloy, not specially provided for:  
With meshes not finer than 30 wires to the lineal in. in warp or filling:  
Old rate 1¢ sq ft, 12½ pct min, 25 pct max ad valorem; new rate ¾¢ sq ft, but not less than 10 pct or more than 20 pct ad valorem.  
With meshes finer than 30 and not finer than 90 wires to the lineal in. in warp or filling:  
Old rate 5¢ sq ft, 20 pct min, 40 pct max ad valorem; new rate 3¢ sq ft but not less than 12 pct or more than 24 pct ad valorem.  
With meshes finer than 90 wires to the lineal in. in warp or filling:  
Old rate 50 pct ad valorem; new rate 30 pct ad valorem.
- 319 (a) Iron or steel anchors and parts thereof:  
Old rate 15 pct ad valorem; new rate 15 pct ad valorem.
- 320 Electric storage batteries and parts thereof, storage battery plates, and storage battery plate material, wholly or partly manufactured, all the foregoing not specially provided for:  
Old rate 40 pct ad valorem; new rate 20 pct ad valorem.
- 321 Antifriction balls and rollers, finished, or unfinished, for whatever use intended:  
Old rate 8¢ lb and 25 pct ad valorem; new rate 4¢ lb and 25 pct ad valorem.
- 322 Railway fishplated or splice bars, and tie plates, made of iron or steel:  
Old rate ¼¢ lb; new rate ¼¢ lb.

### To Be Continued

This complete tariff listing for metals and metal products was compiled by our Washington office. It is to be continued in succeeding issues of THE IRON AGE.



# PROTECT YOUR PRODUCT AGAINST VIBRATION WITH **SEMS *by* SHAKEPROOF**

**PRE-ASSEMBLED TOOTHED**

**LOCK WASHER AND SCREW**

**UNIT PROVIDES GREATER**

**LOCKING POWER**



The use of separate lock washers and screws offers certain problems which not only include the cost of putting them together by hand but also the difficulty of securing maximum fastening efficiency from these two parts. Sems by Shakeproof solve these problems because they not only provide the effective locking of a Shakeproof washer and the cost-saving advantages of mechanical pre-assembly, but also because this combination of a toothed lock washer and screw results in additional special advantages which provide greatly increased fastening efficiency.

In the mechanical pre-assembly of sems by Shakeproof the toothed lock washer is held on the screw by the rolled thread and is free to rotate. The *internal diameter of the washer is smaller than the diameter of the screw thread*. This in turn pulls the teeth further in under the head. When separate lock washers and screws are hand assembled, the internal diameter of the washer must be greater than the diameter of the screw thread. Thus, it is evident that with a sems by Shakeproof a greater portion of each lock washer tooth is in contact with the clamping surface of the screw head. As the locking efficiency of the washer is in direct proportion to the amount of tooth engagement, it must follow that a sems by Shakeproof provides greater locking power.

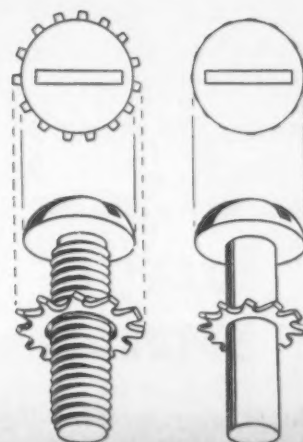
Fasten your product with sems by Shakeproof—it's the modern method of low cost, high efficiency assembly.

**SHAKEPROOF inc.**  
*"fastening Headquarters"*

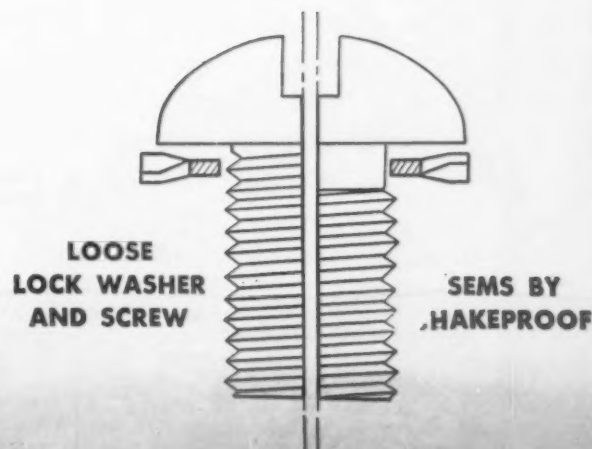
Division of ILLINOIS TOOL WORKS  
2501 North Keeler Avenue, Chicago 39, Illinois  
Offices in Principal Cities

Plants at Chicago and Elgin, Illinois

In Canada: Canada Illinois Tool Co. Ltd., Toronto, Ontario



The illustrations above show the difference between hand assembly of separate washers and screws and the mechanical pre-assembly of sems by Shakeproof. Note the smaller internal diameter with the teeth pulled in beneath the screw head when the lock washer is placed on the screw blank before the thread is rolled. Also, note how the teeth of the hand-assembled combination protrude out from under the screw head.



This combination cross section drawing illustrates the greater tooth engagement of sems by Shakeproof as compared with the tooth engagement of the washer which has been placed on a separate screw.

# Faster Cleaning of Steel Before Welding

STYMIED by heavy pigmented drawing compounds that cling to steel parts awaiting welding? Eliminate hand brushing or wiping with kerosene. Clean faster, more thoroughly with

## OAKITE SATUROL

the efficient presoak liquid solvent. Soak work in Oakite Saturol at room temperature, then hot rinse and watch parts come completely clean. Work is left dry, with just enough oil to protect against rust before and during welding. For detailed procedures consult your nearby Oakite Technical Service Representative. Or write for free literature. No obligation.

OAKITE PRODUCTS, INC.  
30H Thames Street, NEW YORK 6, N. Y.  
Technical Service Representatives Located in  
Principal Cities of United States and Canada

**OAKITE**  
REG. U.S. PAT. OFF.

Specialized Industrial Cleaning  
MATERIALS • METHODS • SERVICE

## Weekly Gallup Polls

(Continued from page 113)

The current survey indicates that of the various arguments given in favor of the Marshall Plan, the one which seems most effective with the public is the argument that it will halt the spread of Communism in Europe.

This argument is more effective among all groups—those best informed about the Marshall Plan and those least informed—than the argument that a large part of the Marshall Plan funds will be spent here in this country.

To test reactions, the institute presented a brief description of the Marshall Plan, using two questions which included estimated dollar costs of the plan. One question explained the plan in terms of spending dollars for goods in the United States. The other, put to a separate but comparable cross-section of voters, explained it in terms of improving conditions in Europe and keeping European nations from going Communist.

Following is the vote of various groups, ranging from those who, in the questioning, showed themselves best-informed about the Marshall Plan, to those who have heard of the plan but said they did not know what it proposed.

"Would you favor or oppose lending Western European countries like England, France, Holland and Norway about \$20 billion over the next 4 years to be spent for goods to be bought in this country?"

	Favor Pct	Op- pose Pct	Qual. opin. Pct	No opin. Pct
Best-informed . . . .	50	28	12	10
Less well-informed . .	51	31	10	8
Vaguely informed . . .	49	32	10	9
Heard of plan but don't know pur- pose . . . . .	44	38	5	13

"Would you favor or oppose sending Western European countries like England, France, Holland and Norway about \$20 billion worth of goods from this country in order to improve conditions there and to keep these countries from going Commu-

nistic?"

	Favor Pct	Op- pose Pct	Qual. opin. Pct	No opin. Pct
Best-informed . . . .	61	18	14	7
Less well-informed . .	56	24	12	8
Vaguely informed . . .	51	30	15	4
Heard of plan but don't know pur- pose . . . . .	47	28	17	8



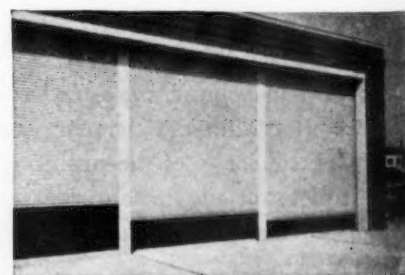
## of Door Costs

Quick, easy, push-button control featured by Kinnear Motor Operated Rolling Doors gives you a tighter grip on all door costs. It helps cut heating and air-conditioning costs through prompt, rapid closing of doors. It saves time and steps (you can have any needed number of additional controls at remote points). It avoids traffic bottlenecks at doorways, and along with these operating advantages, you get the extra durability, protection and space-saving efficiency of these rugged, all-steel doors with their world-famous coiling upward action.

with MOTOR OPERATED

## KINNEAR DOORS

Built any size, for installation in old or new buildings. Write today for complete information.



**KINNEAR**  
ROLLING DOORS

The KINNEAR MFG. COMPANY  
FACTORIES  
1760-80 Fields Ave. • Columbus 16, Ohio  
1742 Yosemite Ave. • San Francisco 24, Calif.  
Offices and Agents in Principal Cities



# How We Beat Rising Costs by Changing to Welded Design

By Francis M. Wick, General Manager  
Silver Manufacturing Company, Salem, Ohio

**D**ESPITE the fact that costs have greatly increased in the past two years, the material costs of our "Ohio" Feed Cutter (Fig. 1) are no more today than on V-J day, due to the savings we have gained by changing to welded steel design.

The change to welded steel has also cut the machine's weight 24%, from 455 to 345 pounds—really a price decrease, since most of our sales are to foreign customers who pay duties assessed on basis of weight.

We originally started experimenting with welded steel design because of the difficulty of getting a regular flow of parts. Our welding department has not only eliminated production bottlenecks, but has enabled us to increase production 79% with only a 20% increase in employees. The chief reason for this is that the parts of welded steel require much less machining, grinding and fitting than the former material. The same man-hours we formerly put into finishing now are used to prepare raw materials for the welding department and handle all finishing.

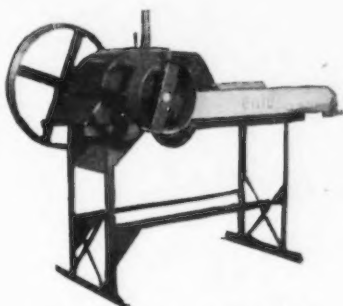


Fig. 1. The "Ohio" Feed Cutter.

An example of cost reductions on the individual parts is the hood (Fig. 2). The hood made by the former method cost \$1.99. We now fabricate it from three pieces of 12-gauge mild steel, flame-cut and brake-formed, for 94.3 cents, a saving of 52½%. Weight is also cut in half, from 17 to 8.5 pounds.

One of the interesting changeovers to welded design is the corrugated roll and shaft (Fig. 3). Weight was reduced from 18.5 to 11 pounds. The corrugated roll is now made of twelve angles, ½" x 1" x ⅝". Six of them at a time are inserted in a special jig and tack-welded together to form a half cylinder. The end discs, stamped from 12-gauge sheets, are slipped over the shaft and held in position for welding in a cradle-type jig. Then, using another special jig, the two corrugated halves are



Fig. 2. Welded steel hood (center) costs 52% less than former design (left). How welded hood is made is shown at right.

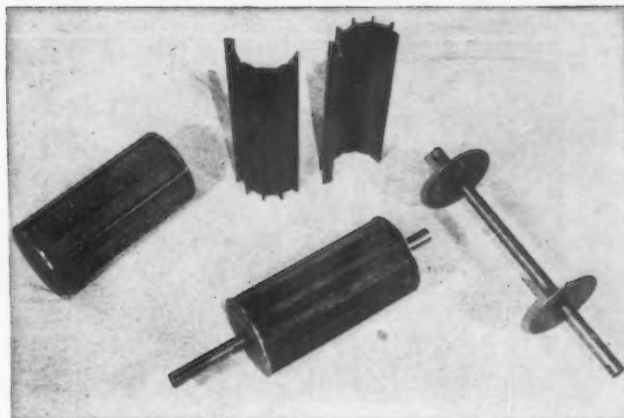


Fig. 3. At left is former corrugated roll. New welded roll and shaft (center) are fabricated from steel shapes as shown.

tack-welded to the discs. Tack welds give sufficient strength.

Welding the shaft and roll as an integral unit eliminates the man-hours formerly spent in machining and broaching keyways—a troublesome job.

In redesigning the flywheel (Fig. 4), weight was removed from the center, where it has a low moment of inertia, and concentrated on the rim, where it has the best effect. Thus the welded steel flywheel weighing 56 pounds has the same efficiency as the former design of 72 pounds.

The flywheel O.D. is 24". The rim is a 2" x 1¼" mild steel bar approximately 6' long which is heated, rolled and welded. Spokes are ⅜" x 2½" bars, drilled and broached at the center to match the hub of cold drawn tubing spaced between them. Welding is done in a jig which has a center post to hold the spokes and tubing in alignment, and three jaws which center the rim around the spokes. Each spoke is welded to the rim with a single pass, and two large tack welds join the hub to the spokes.

Other parts we have converted to welded design are the side plates, pulleys and smooth roll. The frame, formerly bolted, is now arc welded. All welding is done with "Fleetweld 7" electrode.



Fig. 4. The old flywheel was replaced by welded design (right) which weighs 23% less, but is just as efficient.

The above is published by LINCOLN ELECTRIC in the interests of progress. Machine Design Studies are available to engineers and designers. Write The Lincoln Electric Company, Dept. 1413, Cleveland 1, Ohio.

(Advertisement)

## Automotive Engineers Study Electrostatic Coating Procedures

Detroit

• • • Members of the Detroit Section of the Society of Automotive Engineers recently heard Harold P. Ransburg describe the "Electrostatic Coating Processes," a new finishing method widely used in auto parts and accessories manufacture.

Developed during the war for finishing a variety of military products, the process is being used today, particularly for coating round and irregularly shaped pieces.

In this process, the work moves on a conveyor between two screens which carry a heavy electrostatic charge. The charged field between the screens is sufficiently strong to polarize paint particles which are then attracted to the work.

Mr. Ransburg, who heads the coating division of the Harper J. Ransburg Co., Indianapolis, is the inventor of the process.

In addition to the technical lecture, Detroit engineers saw a motion picture of the new Chevrolet-Flint assembly plant. James H. Allen of the Chevrolet-Flint described the features shown in the movie, including the operation of the "power-and-free" conveyor system used at the Flint plant.

## Buick Capacity Boosted By New Fabricating Plant

• • • After more than 2 years Buick has completed an expansion and modernization program comprising 17 new buildings. More than 2 million sq ft of floor space for manufacturing, assembly, foundry, forge and shipping operations have been added to bring Buick capacity in excess of 500,000 cars annually.

The new sheet metal plant has 753,000 sq ft of floor space for stamping, welding and painting hoods, fenders and other metal parts. This plant will fabricate more than 625 tons of steel per day into sheet steel parts for Buick assembly operations in Flint and outlying assembly plants. The plant will also produce service



**SEND US  
YOUR  
REQUIREMENTS**

**...and  
we'll supply  
THE CRANE  
TO MEET THEM!**

Euclid builds cranes in a wide capacity range in various spans and control systems to meet all industrial demands.

Wise judgment of Euclid users has been confirmed by years of reliable service.

**THE EUCLID CRANE & HOIST COMPANY**  
1361 CHARDON ROAD, EUCLID, OHIO



# SPRINGS

## Wire Forms

Large and varied stocks of materials

Completely engineered production with laboratory control from start to finish.



## Small Stampings

Speedy automatics for large orders...Special department for small orders

Latest methods for uniform heat-treating

Super-vigilance in testing and inspection

Spring design help, no obligation



TWO  
PLANTS  
FOR  
SPRING SERVICE

DETROIT 11, MICHIGAN  
ANN ARBOR, MICHIGAN



# PRESS FORGING

## ON THE PRODUCTION LINE BASIS



Photographs courtesy Reed Roller Bit Company, Houston, Texas.

**T**HE dependable performance and high production of Ajax High Speed Forging Presses has led to their installation for turning out forgings on a production line basis. In conjunction with rotary or pusher type furnaces, the heated blank is carried by conveyor through a hydraulic descaler and delivered to the die space of the Ajax Press. The operator handles it through the several forging die impressions and passes it to a second conveyor at the rear, which delivers it to the trimming press operator. After trimming, what was a round-cornered-square blank less than a minute before, emerges as a finished forging. Ajax High Speed Forging Presses are built in nine sizes from 500 to 6000 tons capacities. All incorporate basic construction features which give them the dependable performance so essential to successful operation of a production line.



Write today for  
Bulletin 75-B.

# THE AJAX

MANUFACTURING COMPANY  
EUCLID BRANCH P. O. CLEVELAND 17, OHIO  
110 S. DEARBORN ST. DEWART BUILDING  
CHICAGO 3, ILLINOIS NEW LONDON, CONN.

Wherever **WIRE ROPE** is  
used for Tough Jobs... THERE  
is the Proving Ground for  
**"HERCULES"**  
(Red Strand)

Since the first length of "HERCULES" (Red Strand) Wire Rope was produced, it has continued to increase its many uses in one industry after the other, until today, no matter what 'tough job' is in the offing, "HERCULES" can do it... proving its strength, toughness, elasticity, durability and adaptability.

There is a type and construction to fit every wire rope requirement, whether Round Strand or Flattened Strand—Preformed or Non-preformed.

Our Engineering Department will gladly submit detailed recommendations for any Wire Rope job! Just ask us.

MADE ONLY BY  
**A. LESCHEN & SONS ROPE CO.**  
WIRE ROPE MAKERS  
5909 KENNERLY AVENUE  
ESTABLISHED 1857  
ST. LOUIS 12, MISSOURI, U. S. A.

NEW YORK 6  
CHICAGO 7  
DENVER 2

90 West Street  
810 W. Washington Blvd.  
1554 Wexco Street

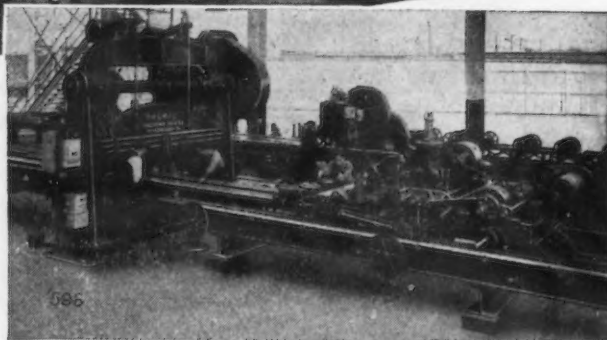
SAN FRANCISCO 7  
PORTLAND 9  
SEATTLE 4

520 Fourth Street  
914 N. W. 14th Avenue  
3410 First Avenue South



## The No. 1 Production Tool!

Available in a wide range of models from completely automatic to hand-operated indicator types.



FOR accurate, economical production of rivet holes in plates or shapes, where quantity output is required, this famous Thomas Spacing Machine is the No. 1 choice of car builders and fabricators.

Write for Bulletin 306 or 306-A

**THOMAS**  
MACHINE MANUFACTURING COMPANY  
PITTSBURGH, 23, PA.

parts for current and previous Buick models.

A unique feature of the sheet metal plant is the installation of five escalators. Two 25-ton cranes unload freight cars from inside the building.

Facilities for welding, bonderizing and painting sheet metal parts are installed in the new building.

A bridge connects the new sheet metal building with an older metal plant which will be continued in use.

### Stable Isotopes For Loan Made Available To Research by AEC

Washington

• • • The Atomic Energy Commission is presently ready to receive applications for loans of stable isotopes recently made available by AEC to U. S. research laboratories.

The loans are made from a pool of stable isotopes at AEC's Oak Ridge plant supervised by the Carbide & Carbon Chemicals Corp. More than 100 stable isotopes of 29 elements are available in the pool, according to AEC.

The new distribution system will speed exploration in the fields of industry, agriculture and medicine, AEC predicted. Research investigations which do not use or adulterate the material will be given highest priority of allocations.

AEC has since August 1946 loaned radioisotopes — isotopes which emit radiations. Stable isotopes are those which do not emit radiations. About 1500 shipments of radioisotopes have been distributed in the U. S. and abroad, the commission said.

The 29 elements of which the stable isotopes are available are: Lithium, boron, carbon, magnesium, silicon, chlorine, potassium, calcium, titanium, chromium, iron, nickel, copper, zinc, germanium, selenium, bromine, zirconium, strontium, molybdenum, silver, cadmium, indium, tin, antimony, tellurium, tungsten, thallium, and lead.

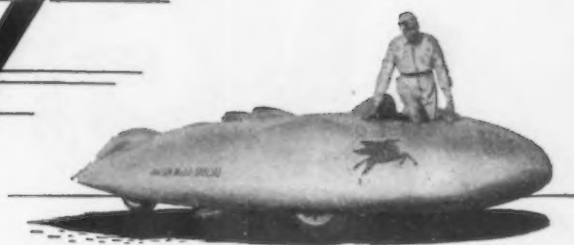
Requests for stable isotope loans are being handled by Isotopes Div., Atomic Energy Commission, Oak Ridge, Tenn.



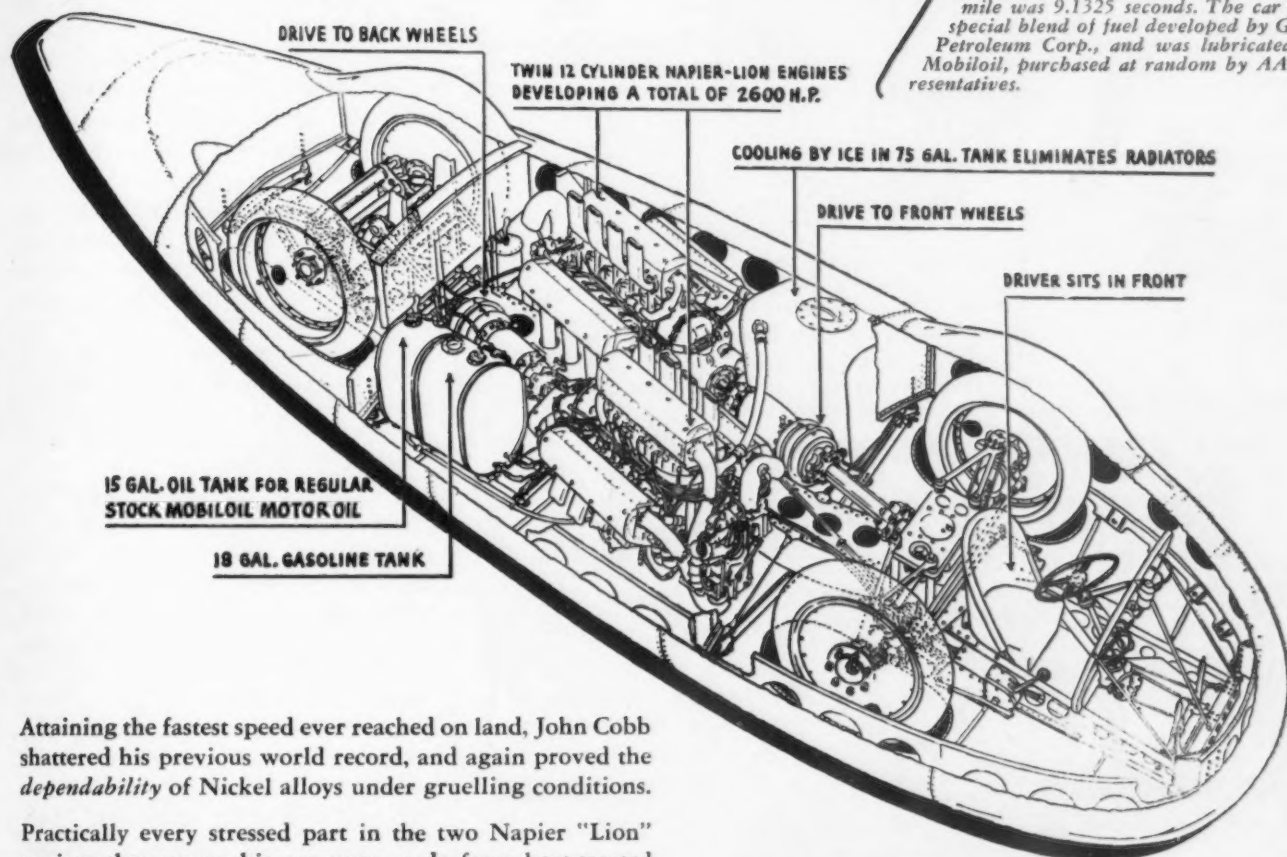
# 400 MPH

WITH THE HELP OF

## NICKEL ALLOYS...



John Cobb drove this "Railton Mobil Special" over the measured mile on the Bonneville Salt Flats in 8.93 seconds... a speed exceeding 403 miles per hour. His average time for the mile was 9.1325 seconds. The car used a special blend of fuel developed by General Petroleum Corp., and was lubricated with Mobiloil, purchased at random by AAA representatives.



Attaining the fastest speed ever reached on land, John Cobb shattered his previous world record, and again proved the dependability of Nickel alloys under gruelling conditions.

Practically every stressed part in the two Napier "Lion" engines that power his car were made from heat-treated Nickel alloy steels.

**ALL PINIONS, GEARS AND SHAFTS** in the differential and transmission, supplied by Firth-Derihon Stamping, Ltd., were made from an electric furnace Nickel-chromium casehardening steel, containing 4.3 percent Nickel.

**THE UNIQUE UNIVERSAL JOINTS** made for this car by Laycock Engineering Co., utilize a 3½ percent Nickel steel spline shaft joined to the housing with bolts of the same Nickel content.

**THE SPEEDSTER'S FRAME** was produced by John Thompson Motor Pressings, Ltd., in Nickel alloyed steel with a minimum tensile strength of 100,000 p.s.i.

**THE STEERING GEAR**, from Burman & Sons, utilizes two Nickel steels and one Nickel-chromium-molybdenum steel, heat treated to high strength and toughness.

**WHEELS FOR THIS CAR** are the same ones made by Dunlop Rim & Wheel Co., Ltd., for Cobb's 1939 record run. They incorporate rims produced from forged rings of a 3½ percent Nickel steel and held together on each wheel by bolts of "18-2" stainless steel, heat treated prior to machining.

Nickel alloys have established notable records in exacting applications. The many compositions available permit selecting the one with extra qualities for a specific use. Discuss your individual metal problems with our technical staff. Write us today.

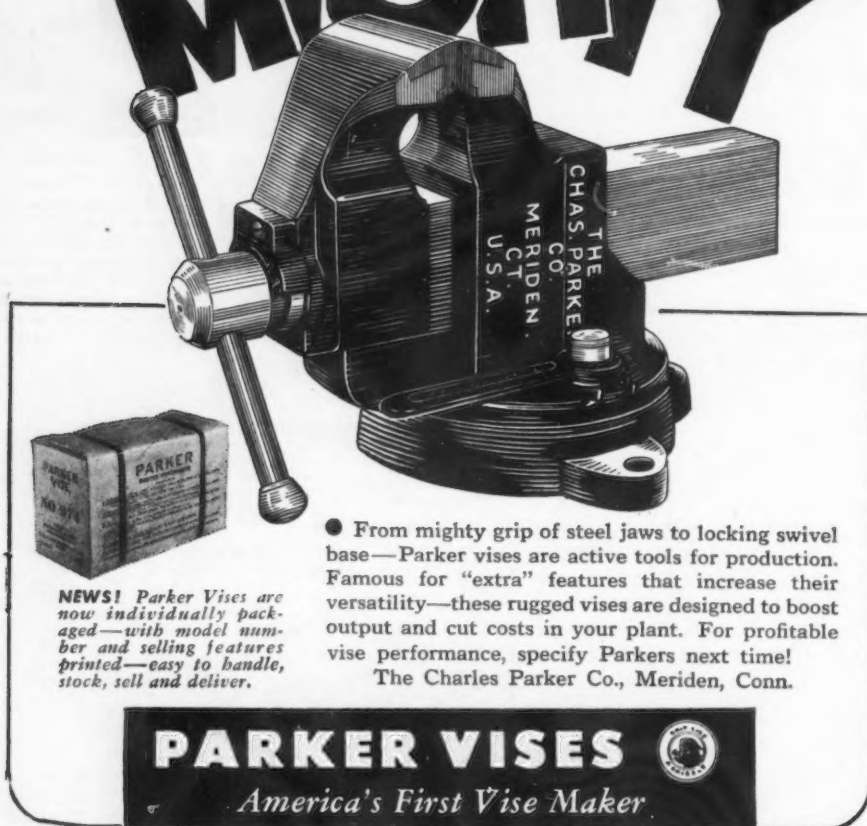


Over the years, International Nickel has accumulated a fund of useful information on the selection, fabrication, treatment and performance of engineering alloy steels, stainless steels, cast irons, copper-base and other alloys containing Nickel. This information is yours for the asking. Write for "List A" of available publications.

## THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

THE IRON AGE, December 18, 1947—133

# MIGHTY



● From mighty grip of steel jaws to locking swivel base—Parker vises are active tools for production. Famous for “extra” features that increase their versatility—these rugged vises are designed to boost output and cut costs in your plant. For profitable vise performance, specify Parkers next time! The Charles Parker Co., Meriden, Conn.

**PARKER VISES**  
*America's First Vise Maker*

**NEWS!** Parker Vises are now individually packaged—with model number and selling features printed—easy to handle, stock, sell and deliver.



## YOUR NAME'S IN THE POT

When you order STRENES METAL dies from us, they are distinctively yours in metallurgical structure.

By varying cupola changes, we are able to give each batch of STRENES METAL special characteristics in respect to hardness, toughness, density, temperability, acid resistance, magnetic qualities, etc. Knowing the drawing and forming problem, we mix the ingredients of STRENES

METAL to meet the requirements.

This explains why STRENES METAL dies deliver an extraordinary number of stampings between redressings, thereby greatly cutting maintenance and production costs.

It will pay you to find out how the advantages of STRENES METAL dies are applicable to your drawing and forming operations. Ask us for specific information.

**THE ADVANCE FOUNDRY CO.**  
100 SEMINARY AVE., DAYTON 3, OHIO

**STRENES METAL**  
DRAWING AND FORMING DIES

## Canadian Mills Expect More Drastic Materials Shortages Next Year

Toronto

••• As a result of large government commitments, ordinary consumers of iron and steel in Canada are facing an even more drastic shortage for 1948 than they had to contend with in the current year. Also there is a possibility that the difficulty in obtaining scrap iron and steel may be reflected in reduction of operating and production schedules by steel mills in this country.

It is not expected that steel imports from the United States will be of sufficient volume to make up any loss to consumers in their domestic supply, but on the contrary announcement from Ottawa indicates that some lines of steel from the States may be sharply reduced in the coming year, and especially structural shapes.

Canadian steel mills now are fully booked to the end of first quarter on practically all lines, and while some have withdrawn from the market, declining additional orders, others are taking orders on an if-and-when delivery basis.

It is further pointed out that there will be a large carry over of tonnage from fourth to first quarter, and with this additional business to be taken care of consumer quotas will be reduced in the first quarter. However, it is stated that the Steel Co. of Canada, Ltd., Hamilton, will have its new cold rolled unit and strip mill completed by the middle of next year.

At present carbon steel bars, steel sheets and plate are providing the most serious problems in the supply column, and there are no indications of improvement in these lines for a long time in the future.

According to reliable information from Ottawa it appears that the Canadian Government is considering drastic action to relieve the U. S. dollar shortage in this country, and is considering a long list of imports from across the line, to include certain lines of steel, as the most likely method of reducing our adverse trade balance and saving American dollars.



## Quantometer Speeds Aluminum Alloy Analyses

(CONTINUED FROM PAGE 67)

smelting of rich alloys in which high melting point metals are simply dissolved in aluminum with time and temperature the only factors involved. In some cases furnace temperatures for these alloys are so high that stirring is impossible. Even if it were possible to stir, the furnace bottoms are so irregular that it is impossible to determine by feel whether or not the addition metal is still on the bottom and yet undissolved. Therefore, extent of solution can be checked only by analysis, and again the expense of furnace holding, especially at these high temperatures, has been considerable.

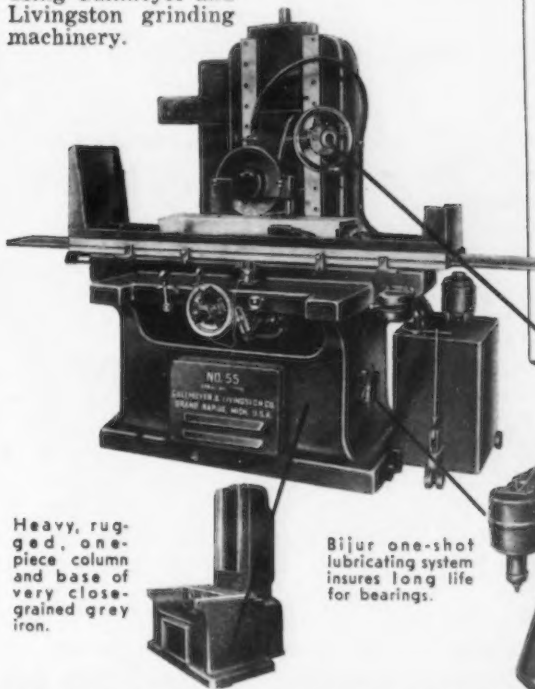
The preparation of raw materials will afford an additional opportunity for the Quantometer to pay for itself. This is especially true in the partial or complete removal of magnesium from raw materials, a process which is very expensive because of the high cost of fluxes. Control in removing this magnesium content is very important as it is essential for the operator to know exactly where he stands throughout such an operation in which the composition is continuously changing. Without close control along the line the operator now is obliged to waste flux and may overshoot the target magnesium concentration which can then involve the expense of an addition operation and an extra analysis or two.

Although the instrument is currently being used on a production basis only for individual magnesium contents and for rich alloys such as the 5-pct titanium alloy, calibration and developmental work with the instrument is almost completed and full utilization for quality control in day-to-day line production is scheduled for the first of the year. As soon as production use is begun, the company expects that furnacing times will drop to a bare minimum, as control all along the line, with about five samples per melt, is established.

## proven performance

SELLS 6 OUT OF 10 GRAND RAPIDS GRINDERS

• Of every ten Grand Rapids Hydraulic Feed Surface Grinders sold, six are to customers already using Gallmeyer and Livingston grinding machinery.



Heavy, rugged, one-piece column and base of very close-grained grey iron.

Bijur one-shot lubricating system insures long life for bearings.

### FEATURES

- 125 feet per minute longitudinal table speed
- Separate motors to drive grinding wheel spindle and hydraulic mechanism
- Two spindle speeds to reduce wheel costs
- Portable, self-contained motor driven coolant system
- Vickers vane type hydraulic pump
- Starters, controls and motors easily accessible
- Special G & L spindle motor end-bells and over-size precision ball bearings

Write for Bulletin GL 101



Patented vertical adjustment of wheel head.



GALLMEYER & LIVINGSTON CO., 200 STRAIGHT ST., S. W., GRAND RAPIDS 4, MICH.

## PERFORATED METAL

### INDUSTRIAL and

### ORNAMENTAL

INDUSTRIAL PERFORATIONS include round, square and special shaped perforations as used in mechanical arts. Our line is comprehensive.

ORNAMENTAL PERFORATIONS are used in architectural grilles, metal furniture, enclosures, cabinets, stoves and for ornamentation. Many attractive and exclusive patterns. H & K workmanship is unsurpassed.

**Any Metal  
Any Perforation**

*The*  
**Harrington & King**  
PERFORATING CO.

5457 FILLMORE STREET, CHICAGO 44, ILL. Eastern Office: 114 Liberty Street, New York 6, N. Y.

# MACHINE TOOLS

... News and Market Activities

## New Firm Orders in Machine Tool Industry Decrease by 15 Pct

... A preliminary estimate of the machine tool industry's November performance indicates about a 15 pct drop in new firm orders, a 5 pct increase in cancellations and approximately a 12 pct drop in shipments.

Simultaneously, the industry backlog of unfilled orders is being eaten into at a noticeable rate, and will probably be down, but not very much. Fewer new firm orders and the increase in cancellations, approximately a 20 pct falling off in business, suggests to some observers that the industry has lean times ahead.

Indications are, however, that major segments of the industry have a good deal of confidence in the future, for prices are going up, as new and higher production costs provide the impetus.

A few dealers report that business is still holding up, which is in sharp contrast to reports from most sectors of the manufacturing end of the industry. The month of December has not been a bad month for some dealers, demand has been fair, about comparable to November.

The price situation is very unstable at the moment where some lines are concerned, and at the same time deliveries are so far extended in some cases that it almost looks as if some producers had their inventories trimmed to the bone and simply are putting the orders in the shop when they are received.

Considerable interest surrounds the industrial mobilization program, which is quite a hush-hush affair in so far as machine tools are involved. Qualified sources in the trade report they are completely baffled and nobody seems to know if orders for machine tools have been placed by those in charge.

According to reports, the JANMAT program will end with about 92,000 tools for the strategic reserve about the first of the year, or Mar. 1. Official date for the

## Shipments Decrease 12 Pct, Cancellations Increase 5 Pct in November

o o o

finish is still open to speculation, but whenever it comes, dealers will be allowed to buy again. A statement from War Assets Administration reveals that only about 12,000 machine tools have been shipped by WAA to warehouses in compliance with the program.

"On the basis of present plans, which may be expanded at a future time, approximately 92,000 items of machinery and equipment may be earmarked and transferred to the Army and the Navy. This program, which is essential to the security of the nation, will help to dispose of a sizable part of the total inventory of metalworking equipment."

The replacement parts business for machine tools seems to be holding up fairly well; so well, in fact, that some producers are giving customers the excuse that there are so many tools out in use at the present time that they can't build up a parts inventory.

Some of the automatic screw machines are being quoted for 1950 delivery, an almost unreasonable extension, making it impossible to take into account either the imponderables or the unforeseen which may take place in that time. Big cancellations, charges, etc., result from such situations.

Last year at this time, the industry was disturbed over hold-ups on new tooling orders for some of the General Motors models, and a bad case of the jitters was prevalent in Detroit. A price increase in pig iron was among the first in a string of manufacturing costs which ultimately brought machine tool builders to raising their prices.

In the East, while not having

assumed sizable proportions, sales are increasing and indications are December will be a much better month than anticipated. Most current sales are for first quarter 1948 delivery.

More pronounced is the comeback in small tool sales, all New England manufacturers reporting a decided improvement. Union Twist Drill Co., Athol, Mass., is but one case in point. G. F. Holland, company president, says business is good and the company is expanding operations. Employees in the main plant are working 40 and 45 hours per week, varying by individual departments, with some workers on a 50-hour schedule. It looks like continuing activity into the first quarter of 1948. The company's operations have been benefited considerably by the removal of surplus cutting tools from the market by the WAA.

Lustron Corp., Columbus, Ohio, has placed orders totaling nearly \$1 million for machinery to be used in the mass production of the low-cost porcelain enamel steel Lustron House, according to Carl G. Strandlund, president. Warren City Mfg. Co., Warren, Ohio, has received an order for \$800,000 worth of presses, ranging in size from 50 tons to two of 600 tons. Dies valued at \$175,000 have been purchased from Carlin Tool & Die Co., Detroit.

Miller Mfg. Co., Detroit manufacturer of special tools for automobile, truck and tractor dealers, has purchased the outstanding common stock of Buckeye Forgings Co., Cleveland, at about \$1 million. At the same time the Miller Co. is selling its 52 pct interest in the Rieke Metal Products Corp., Auburn, Ind. Miller Co. sales in the year ended Sept. 30, 1946, approximated \$4 million, while net income was \$384,000. Combined sales of Miller, including Buckeye, it is estimated, will total about \$7 million a year.



# PRECISION PARTS BY



**T**YPICAL of the precision work we can do for you are the radar parts illustrated above. We are geared to produce component assemblies for *your* machines on a quantity basis. Extreme accuracy is the keynote. Thanks to modern equipment and skilled craftsmen we have become specialists in machining metals to close tolerances.

You can increase your production without costly delays or investments in building and machinery. Whenever your plans call for new machinery, it will pay you to discuss it first with a Fuller engineer.

**MACHINE DIVISION**

*The* **FULLER BRUSH Co.**

HARTFORD 2, CONN.

WRITE TO DEPT. 87B FOR BOOKLET

"FULLER DESIGNED AND BUILT"

# NONFERROUS METALS

... News and Market Activities

## Copper

• • • Demand is very strong for January copper. Wire mills are taking all the copper they can get, and the brass mill demand is reported to be continuing to improve although both mills and copper producers agree that their requirements are not as great as they were in the first quarter. The export market is reported to be a little stronger, but tonnages are relatively small as the big buyers are not in the market as they were up until April. Copper consumers are still suffering from the 3-week shutdown of the Kennecott Utah Mine in October. However, it is obvious to producers that the present pressure of orders is largely caused by the replenishment of inventories which were permitted to drop way down during the summer. The Dept. of Commerce proposal to impose stricter export allocations on copper and copper products is expected to have little effect on copper exports as for some time there has been no granting of licenses for domestic copper and under the revised regulations it is expected that there will be no attempt at restrictions of foreign copper refined domestically. However, there is some thought in the trade that the proposed action may involve some restriction of export sales of the brass mills.

\* \* \*

• • • The November figures released by the Copper Institute show that domestic production of crude primary metal is down to 64,901, down 4400 tons from October and nearly 10,000 tons below the September figure. Refined copper production was 97,525 tons, down 10,500 tons from October. Deliveries to customers dropped 6000 tons in November to 106,232

tons. Refined stocks at the end of November were only 66,622 tons, almost down to the irreducible minimum. This inventory represents a working inventory decrease of 7885 tons during the month.

## Raise Brass Ingot Prices

New York

• • • Only two weeks after the last price increase in ingot brass and bronze prices, Federated Metals Div., American Smelting & Refining Co., announced new increases effective Dec. 9. A 1¢ per lb increase was made on the red brass alloys (85-5-5-5), bearing bronzes (80-10-10), yellow bronzes, aluminum bronze and miscellaneous nickel alloys. An increase of 0.75¢ per lb was made in gun-metal bronzes (88-10-2). Half a cent increase was made in some manganese bronze compositions; others were increased 1¢. Other producers have met the price increases but are still maintaining a price spread in the market.

## Antimony

• • • There is a report current that the United Kingdom has bought out the Bolivian antimony supply for the first half of the year. Market factors are inclined to doubt the authenticity of the report because the British Ministry of Supply is not accustomed to purchase ore in bulk. Customarily a large proportion of the Bolivian antimony goes to Britain because they can make good use of the sterling exchange. It is observed that the development, if true, might create some shortage for battery manufacturers who use high grade Bolivian and Peruvian ores for production of grid metal.

## Minerals Committee

New York

• • • The appointment of a Minerals Advisory Committee to advise the President and Congress on minerals policy is being discussed by the metals industry here. It is expected that an important phase of the committee's work will be to work out a subsidy program.

The new group elected D. H. McLaughlin, president of the Homestake Mining Co., New York, chairman, and set up 12 subcommittees to deal with specific problems.

C. K. Leith, Washington, was elected vice chairman-at-large, and these commodity committee chairmen, who also will serve as vice chairmen, were named:

Ferrous metals, Alexander C. Brown, Cleveland Cliffs Iron Co., Cleveland; copper metals, R. Page, Phelps Dodge Corp., New York; lead-zinc metals, H. I. Young, American Zinc, Lead and Smelting Co., St. Louis; precious metals, D. H. McLaughlin; alloy metals, W. J. Priestley, Union Carbide and Carbon Corp., New York; industrial minerals, including light metals such as aluminum, H. M. Albright, United States Potash Co., New York.

## Offer Lead-Base Bullion

Washington

• • • Bids on approximately 320 short tons of Korean lead-base bullion will be received by the U. S. Commercial Co. through Dec. 22, the Reconstruction Finance Corp. announced last week.

Particulars may be obtained from USCC at 811 Vermont Ave., N. W., Washington 25, D. C.

## Raise Copper, Brass Prices

New York

• • • Scrap dealers report that the prices of all copper and red brass scrap grades were raised by 1/2¢ per lb as the result of increased buying by ingot producers who recently raised their prices. All other scrap grades remained unchanged.

### Nonferrous Metals Prices

Cents per pound

	Dec. 10	Dec. 11	Dec. 12	Dec. 13	Dec. 15	Dec. 16
Copper, electro, Conn. ....	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn. ....	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York.....	80.00	80.00	80.00	80.00	80.00	80.00
Zinc, East St. Louis .....	10.50	10.50	10.50	10.50	10.50	10.50
Lead, St. Louis .....	14.80	14.80	14.80	14.80	14.80	14.80



# NONFERROUS METALS PRICES

## Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point, freight allowed	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American Laredo Tex.	33.00
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be	\$20.50
Beryllium aluminum 5% Be, dollars per lb contained Be	\$35.50
Cadmium, delfd	\$1.75
Cobalt, 97-99% (per lb)	\$1.65 to \$1.72
Copper electro, Conn. Valley	21.50
Copper, lake, Conn. Valley	21.625
Gold, U. S. Treas., dollars per oz.	\$35.00
Indium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$80 to \$90
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York	\$80 to \$82
Nickel, electro, f.o.b. New York	37.67
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$66 to \$69
Silver, New York, cents per oz.	74.625
Tin, Straits, New York	80.00
Zinc, East St. Louis	10.50
Zinc, New York	11.06
Zirconium copper, 6 pct Zr. per lb contained Zr.	\$8.75

## Remelted Metals

### Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	18.50-19.00
No. 120	18.00-18.50
No. 123	17.50-18.00
80-10-10 ingot	
No. 305	22.50-23.00
No. 315	20.50-21.00
88-10-2 ingot	
No. 210	28.50-29.00
No. 215	26.75-27.00
No. 245	21.75-22.50
Yellow ingot	
No. 405	14.50-15.50
Manganese Bronze	
No. 421	18.00-18.50

### Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys:	
0.30 copper, max.	16.00-16.75
0.60 copper, max.	15.50-16.25
Piston alloys (No. 122 type)	15.50-16.00
No. 12 aluminum (No. 2 grade)	15.25-15.75
108 alloy	15.50-16.00
195 alloy	15.50-16.50
AXS-679	15.75-16.25
Steel deoxidizing aluminum, notch-bar, granulated or shot	
Grade 1—95 pct-95½ pct	15.25-16.00
Grade 2—92 pct-95 pct	14.00-15.00
Grade 3—90 pct-92 pct	13.50-14.50
Grade 4—85 pct-90 pct	13.25-14.00

## Electroplating Supplies

### Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	37½
Electrodeposited	32.34
Rolled, oval, straight, delivered	32.59
Brass, 80-20, frt. allowed	
Cast, oval, 15 in. or longer	33½
Zinc, cast, 99.99	18½
Nickel, 99 pct plus, frt. allowed	
Cast	51
Rolled, depolarized	52
Silver 999 fine	
Rolled, 1000 oz. lots, per troy oz.	67½

### Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	44.50
Copper sulfate, 99.5, crystals, bbls	11.50
Nickel salts, single, 425 lb bbls, frt. allowed	14.50
Silver cyanide, 100 oz. lots, per oz.	54.00
Sodium cyanide, 96 pct, domestic, 200 lb drums	16.00
Zinc cyanide, 100 lb drums	35.50
Zinc sulfate, 89 pct, granules, bbls, frt. allowed	7.75

## Mill Products

### Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall: 3S, 43.5¢; 52S-O, 67¢; 24S-T, 71¢; base, 30,000 lb.	
Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢; 61S, 23.8¢; 34S, 24S-AL, 24.2¢; 75S, 75S-AL, 30.5¢; base, 30,000 lb.	
Flat Sheet: 0.136-in. thickness: 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb.	
Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S 45.5¢; base, 30,000 lb.	
Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 37.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢; 1 in., 2 in., 27¢; base, 5000 lb. Rod: 2S, 3S, 1¼ to 2½ in. diam. rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. Round Wire: drawn, coiled, B & S gage 17-18; 2S, 3S, 33.5¢; 56S, 39.5¢ 10,000 lb base. B & S gage 00-1; 2S, 3S, 21¢; 56S, 30.5¢. B & S 15-16; 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.	

### Magnesium

(Cents per lb f.o.b. mill. Base quantity 30,000 lb.)

Sheet and Plate: M. F.S. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 14, 69¢-74¢; 18, 79¢-81¢; 18, 87¢-89¢; 22, \$1.25-\$1.31; 24, \$1.71-\$1.75.	
Round Rod: M. diam, in., ¼ to ½, 47¢; ½ to ¾, 45¢; ¾ to 1, 43.5¢; 1 to 1½, 42.5¢. Other alloys higher.	
Square, Hexagonal Bar: M. size across flats, in., ¼ to ½, 52.5¢; ½ to ¾, 47.5¢; ¾ to 1, 45¢; 1 to 1½, 44¢. Other alloys higher.	
Solid Shapes, Rectangles: M. form factors, 1 to 4, 46¢; 11 to 13, 49¢; 20 to 22, 51.5¢; 29 to 31, 59.5¢; 35 to 40, 75.5¢; 47 to 49, 98¢. Other alloys higher.	
Round Tubing: M. wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16, \$1.21; 5/16 to ¾, \$1.12; ¾ to 1, 97¢; 0.058 to 0.064, 7/16 to ½, 89¢; ½ to ¾, 81¢; 0.065 to 0.082, ¾ to 1, 76¢; ¾ to 1, 72¢; 0.083 to 0.108, 1 to 2, 68¢; 0.165 to 0.219, 2 to 3, 59¢; 3 to 4, 57¢. Other alloys higher.	

### Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets	41	41
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks	..	31

### Zinc

(Cents per lb, f.o.b. mill)

Sheet, L.C.L.	15.50
Ribbon, ton lots	14.50
Plates	
Small	13.50
Large, over 12 in.	14.50

### Copper, Brass, Bronze

Cents per pound, freight prepaid on 200 lb.

	Extruded Shapes	Rods	Sheets
Copper	33.53	..	33.68
Copper, hot-rolled	30.03	..	..
Copper, drawn	31.03	..	..
Low brass	34.04*	31.07	31.38
Yellow brass	32.39*	29.32	29.63
Red brass	34.65*	31.68	31.99
Naval brass	29.56	28.31	34.25
Leaded brass	27.98	24.39	30.13
Commercial bronze	35.52*	32.80	33.11
Manganese bronze	33.14	31.64	37.75
Phosphor bronze, 5 pct.	53.25*	52.25	52.00
Muntz metal	29.17	27.92	32.36
Everdur, Herculoy, Olympic, etc.	37.07	35.57	38.44
Nickel silver, 5 pct.	41.20	40.28	33.67
Architectural bronze	27.94	..	..
*Seamless tubing.			

## Scrap Metals

### Brass Mill Scrap

(Lots of less than 15,000 lb.)

Cartridge brass turnings	14½
Loose yellow brass trimmings	15½

(Dealers' buying prices, f.o.b. New York in cents per pound.)

### Copper and Brass

No. 1 heavy copper and wire	16½-17
No. 2 heavy copper and wire	15½-16
Light copper	14-14½
Auto radiators (unsweated)	9¼-9¾
No. 1 composition	12-12½
No. 1 composition turnings	11½-12
Clean red car boxes	10-10½
Cocks and faucets	9¾-10¼
Mixed heavy yellow brass	7½-8
Old rolled brass	8-8½
Brass pipe	8¾-9¾
New soft brass clippings	11½-12
Brass rod ends	9-9¾
No. 1 brass rod turnings	9-9½

### Aluminum

Alum. pistons with struts	4½-5
Aluminum crankcases	6-6½
2S aluminum clippings	9-9½
Old sheet & Utensils	6-6½
Mixed borings and turnings	2
Misc. cast aluminum	5½-6
Dural clips (24S)	5-5½

### Zinc

New zinc clippings	6-6½
Old zinc	4½-5
Zinc routings	2½-3
Old die cast scrap	2½-3

### Nickel and Monel

Pure nickel clippings	15½-17½
Clean nickel turnings	14-15
Nickel anodes	16-17
Nickel rod ends	16-17
New Monel clippings	12-13
Clean Monel turnings	7-8
Old sheet Monel	10-10½
Old Monel castings	7½-8
Inconel clippings	8-8½
Nickel silver clippings, mixed	7½-8
Nickel silver turnings, mixed	5½-6

### Lead

Soft scrap lead	10½-11½
Battery plates (dry)	6-6½

### Magnesium Alloys

Segregated solids	6½-7
Castings	4½-5½

### Miscellaneous

Block tin	63-65
No. 1 pewter	48-50
No. 1 auto babbitt	38-40
Mixed common babbitt	11½-12
Solder joints	14½-15
Siphon tops	38-40
Small foundry type	13-13½
Monotype	12-12½
Lino and stereotype	11½-12
Electrotype	10-10½
New type shell cuttings	11-11½
Clean hand picked type shells	4½-5
Lino and stereo dross	5-5½
Electro dross	3¼-3½

### Lead Products

(Cents per lb)

F.o.b. shipping point freight collect	
Freight equalized with nearest free delivery point.	
Full lead sheets	18.25
Cut lead sheets	18.75
Lead pipe, manufacturing point	17.50
Lead traps and bends	List +42%
Combination lead and iron bends and ferrules, also combination lead and iron ferrules	List +42%
Lead wool	19.50

# UNIT

## TIME SAVERS FOR

## SCRAP YARDS!

UNIT tops them all for handling mixed iron . . . compressed bundles from baler to car . . . or loose scrap from bins to car. Fast on the lift . . . fast on the swing. Loads trucks and cars, in your own yard or at customer's plant. Ideal also for breaking up metals with skull cracker ball. A timesaver and profit-maker for scrap yards.

**5 to 10  
TON  
CAPACITY**



**GRAPPLE**



**UNIT MOBILE CRANE . . .**  
Self-Propelled, rides on rubber, full-revolving, quickly convertible. Travels anywhere. Operated by ONE man. Powered by ONE engine. Controlled from ONE position in FULL VISION CAB.

**CONTACT FACTORY DIRECT  
FOR PRICE AND DELIVERY  
or See Your Dealer**



**UNIT CRANE & SHOVEL CORP. MILWAUKEE 14,  
WISCONSIN, U.S.A.**

**Address: 6517 W. BURNHAM STREET**



**CLAMSHELL**



## Efforts to Hold Prices Meet Strong Resistance

New York

•••The so-called "formula" price system which has been followed by some steel mills in their buying policies in recent weeks hung in delicate balance at mid-week. There were strong pressures on the effort to keep scrap prices down, and some brokers in the East have already tacitly given up the idea of buying any substantial tonnages to permit them to sell to "formula" customers—at formula prices.

The small movements of No. 1 scrap at the formula levels were primarily responsible for the tenuous move to shove the formula out the window. Movement to mills since the system was suggested have been scant. Although there have been some more or less standing offers, due to the refusal of brokers to take any business at lower levels, the mills have in effect been out of the market for several weeks.

The fact that, due to extensions beyond the originally anticipated cancellation date, and action of a few, usually smaller, mills in continuing their purchases at about previous levels, there has been some business continuing at higher price levels, has also made the pressure upward on the market exceptionally strong.

Cast scrap still continues to go up, and specialty grades as well. It is felt that the pressure on specialties is due to some overgrading which is in effect a by-passing of hopes for lower No. 1 levels.

THE IRON AGE heavy melting steel composite price dropped 50¢ this week to \$39.75, due to a reduction in Philadelphia of \$1.50. There were no other changes in the No. 1 price at major centers.

PITTSBURGH—The week began as one of the dullest of the year from the standpoint of market activity. Shipments from dealers are still poor. Brokers are scurrying to complete orders—taxwise many feel it smart to fill orders this year, taking any necessary losses now. Underneath the calm surface there is far more strength than weakness apparent. While large buyers say they are confident they can hold the price line, brokers are not sure the smaller consumers will stay in line. Though it hasn't happened here yet, there are reports in the trade that the

"Little OPA" formula setup is bulging at the seams in some districts. Blast furnace grades of turnings appear poised for a rise here in response to a sudden surge of pressure which developed early this week.

CHICAGO — Cast scrap continued its runaway tendency last week when these items were purchased at all time high prices. It is believed that this market may react violently after Jan. 1. One factor that has bulled cast scrap to its present high is broker covering on short orders, all of which has cost the brokers plenty. Over-grading has again reared its head in open hearth items. This expedient has been urged in an effort to keep the formula prices in force. Observers here say this practice indicates the first crack in formula prices has already occurred which may split the hold line adherent wide open later on.

PHILADELPHIA—It is understood that two brokers offered Monday to take heavy melting scrap freely at \$40 delivered. It is too early to learn whether brokers have been able to buy at this figure, but in the absence of a major consumer from the market, it is significant that dealers find that their orders are running out without any new orders being placed. Shipments earmarked for this mill have been diverted to other mills in this area, so that they find themselves in a rather comfortable scrap position. It appears that dealers may find themselves forced to do business at this price if they want to continue operations. The heavy melting market is quoted at \$40 to \$41. The turnings and cast markets are firm and unchanged.

DETROIT—With auto production continuing at high levels, total scrap shipments during December appear to be holding up surprisingly well with two major scrap sources indicating December shipments will compare favorably with November. Other sources, however, have reported that dealer activity has fallen off appreciably. Meanwhile, the upward spiral of No. 1 cupola grades continues unchecked and voice lots of No. 1 cupola are reported to be bringing up to \$60 per gross ton delivered. Due to an error in printing, the price of No. 1 cupola at Detroit was incorrectly quoted in last week's issue. The correct price last week was \$50 to \$51 per gross ton.

CLEVELAND—While definite sales at more-than-formula prices are difficult to track down, the scrap market is showing all the early symptoms of a price breakthrough. Rumors of really fancy prices being either offered or paid in other districts has the trade on edge, and ready to move. It is possible that major consumers will pay very few "official" prices over formula until after the first of the year, when the battle for the tonnage will be brought out in the open. The foundry grades are very strong. While earmarked railroad heavy melting moves at \$40.50, so-called free tonnages of this material are bringing \$46 to \$48.

BUFFALO—Apparently no major sales were transacted at more than formula prices in this area during the past week. Although all companies seem to be holding the line on prices, an ever-increasing percentage of scrap is going to the foundries as specialties. All cast grades are up \$2 per ton.

NEW YORK — Scrap movement was dwindling here this week as the pressure from mills on prices continued its repercussions in this broker-dealer market. There was a general restlessness price-wise, with considerable variation in quotations for No. 1 steel being noted. Cast grades continue their upward swing in the action of both dealers and steel mills in buying.

BOSTON — Brokers still talk \$31 for heavy steel, but are making little effort to buy. However, they are placing their bids for Nos. 1 and 2 steel, borings, turnings, cast, etc. offered by the Metropolitan Transit Commission and for 600 tons of unprepared, 400 tons of light iron, and 200 tons of No. 2 steel offered by the local navy yard. Snow, ice and cold weather have given some yards an excuse to close.

BIRMINGHAM—Dealers and mills here are still deadlocked over prices for open-hearth grades with little material moving on the mill offered price of \$37.00 for No. 1 steelmaking scrap. Cast grades continue to soar with \$60 reported paid for a few carloads.

ST. LOUIS —The market for foundry grades continues to advance as a result of heavy demand and short supply. Melting grades are unchanged, but the movement is light, because of the prices being offered by the mills. Cold weather is also a factor in curtailing the movement.

CINCINNATI — The market here remains at the same level as last week, with the prevailing price for top grades at about \$39.00. While the demand is strong, some buyers report that they are staying out of the market in an attempt to lower inventories before the first of the year. One buyer in the market indicated that they are getting most of their supply from earmarked industrial scrap. The dealers indicate that they think the old OPA figure plus \$20 which is the formula some mills worked out for buying, is a fair price. There are some reports of higher prices coming from small consumers.

TORONTO — Trading is slow in the Canadian scrap markets. Winter conditions have settled over most parts of Canada and scrap collections in the rural districts have been brought to an end until next spring. Dealers now are depending almost wholly on industrial plants for their scrap supply and shipments to consumers have declined in the past two or three weeks. The situation remains critical and steelmaking schedules may have to be reduced before the winter is over, unless large tonnage importations of scrap are available.

# IRON AND STEEL SCRAP PRICES

## PITTSBURGH

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$40.00
RR. hvy. melting	\$40.50 to 41.00
No. 2 hvy. melting	40.00
RR. scrap rails	49.00 to 50.00
Rails 2 ft. and under	54.00 to 55.00
No. 1 comp'd bundles	40.00
Hand bldd. new shts.	40.00
Hvy. axle turn.	41.50 to 42.00
Hvy. steel forge turn.	41.50 to 42.00
Mach. shop turn.	35.00 to 35.50
Shoveling turn.	36.50 to 37.00
Mixed bor. and turn.	35.00 to 35.50
Cast iron borings	35.50 to 36.00
No. 1 cupola cast.	53.00 to 54.00
Hvy. breakable cast.	40.50 to 41.50
Malleable	59.00 to 60.00
RR. knuck. and coup.	52.50 to 53.50
RR. coil springs	52.50 to 53.50
RR. leaf springs	52.50 to 53.50
Roller steel wheels	52.50 to 53.50
Low phos.	47.00 to 48.00

## CHICAGO

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$38.50 to \$39.00
No. 2 hvy. melting	38.50 to 39.00
No. 1 bundles	38.50 to 39.00
No. 2 dealers' bundles	38.50 to 39.00
Bundled mach. shop turn.	38.50 to 39.00
Galv. bundles	36.50 to 37.00
Mach. shop turn.	33.50 to 34.00
Short shov. turn.	35.50 to 36.00
Cast iron borings	34.50 to 35.00
Mix. borings & turn.	33.50 to 34.00
Low phos. hvy. forge	47.00 to 48.00
Low phos. plates	44.00 to 45.00
No. 1 R.R. hvy. melt.	46.00 to 47.00
Re-rolling rails	60.00 to 61.00
Miscellaneous rails	54.00 to 55.00
Angles & splice bars	55.00 to 56.00
Locomotive tires, cut	55.00 to 56.00
Cut bolster & side frames	54.00 to 54.50
Standard stl. car axles	60.00 to 61.00
No. 3 steel wheels	51.50 to 52.00
Couplers & Knuckles	52.00 to 52.50
Rails 2 ft. and under	58.00 to 59.00
Malleable	71.00 to 73.00
No. 1 mach. cast.	62.00 to 65.00
No. 1 agricul. cast.	60.00 to 61.00
Hvy. breakable cast.	45.00 to 48.00
RR. grate bars	52.00 to 53.00
Cast iron brake shoes	52.00 to 53.00
Cast iron carwheels	48.00 to 49.00

## CINCINNATI

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$38.00 to \$40.00
No. 2 hvy. melting	38.00 to 40.00
No. 1 bundles	38.00 to 40.00
No. 2 bundles	38.00 to 40.00
Mach. shop turn.	33.00 to 34.00
Shoveling turn.	33.00 to 34.00
Cast iron borings	30.00 to 31.00
Mixed bor. & turn.	30.00 to 31.00
Low phos. plate	49.00 to 50.00
No. 1 cupola cast.	53.00 to 55.00
Hvy. breakable cast.	42.00 to 43.00
Scrap rails	49.00 to 50.00

## BOSTON

Dealers' buying prices per gross ton, f.o.b. cars:	
No. 1 hvy. melting	\$35.00 to \$36.00
No. 2 hvy. melting	35.00 to 36.00
Nos. 1 and 2 bundles	35.00 to 36.00
Busheling	35.00 to 36.00
Shoveling turn.	31.50 to 32.00
Machine shop turn.	29.00 to 30.00
Mixed bor. & turn.	29.00 to 30.00
C'n cast. chem. bor.	33.00 to 34.00
No. 1 machinery cast.	44.00 to 45.00
No. 2 machinery cast.	44.00 to 45.00
Heavy breakable cast.	40.00 to 41.00
Stove plate	39.00 to 40.00

## DETROIT

Per gross ton, brokers' buying prices, f.o.b. cars:	
No. 1 hvy. melting	\$34.75 to \$35.25
No. 2 hvy. melting	34.75 to 35.25
No. 1 bundles	34.75 to 35.25
New busheling	34.75 to 35.25
Flashings	34.75 to 35.25
Mach. shop turn.	28.50 to 29.00
Shoveling turn.	29.50 to 30.00
Cast iron borings	29.50 to 30.00
Mixed bor. & turn.	29.50 to 30.00
Low phos. plate	39.75 to 40.25
No. 1 cupola cast.	54.00 to 55.00
Heavy breakable cast.	43.00 to 45.00
Stove plate	43.00 to 45.00
Automotive cast.	54.00 to 55.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

## PHILADELPHIA

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$40.00 to \$41.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	40.00 to 41.00
Mach. shop turn.	33.50 to 34.50
Shoveling turn.	35.00 to 36.00
Mixed bor. & turn.	33.50 to 34.50
Clean cast chemical bor.	39.00 to 41.00
No. 1 machinery cast.	52.00 to 55.00
No. 1 mixed yard cast.	49.00 to 50.00
Hvy. breakable cast.	49.00 to 50.00
Clean auto cast.	52.00 to 54.00
Hvy. axle forge turn.	42.00 to 43.00
Low phos. plate	46.50 to 47.50
Low phos. punchings	46.50 to 47.50
Low phos. bundles	45.50 to 46.50
RR. steel wheels	50.00 to 51.00
RR. coil springs	50.00 to 51.00
RR. malleable	60.00 to 65.00

## ST. LOUIS

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$40.50 to \$41.00
No. 2 hvy. melting	38.00 to 39.00
Bundled sheets	38.00 to 39.00
Mach. shop turn.	32.00 to 33.00
Locomotive tires, uncut.	46.00 to 47.00
Mis. std. sec. rails	52.00 to 53.00
Re-rolling rails	57.00 to 58.00
Steel angle bars	52.00 to 53.00
Rails 3 ft. and under	54.00 to 55.00
RR. steel springs	48.00 to 49.00
Steel car axles	51.00 to 52.00
Grate bars	48.00 to 49.00
Brake shoes	47.00 to 48.00
Malleable	66.00 to 68.00
Cast iron car wheels	49.00 to 50.00
No. 1 machinery cast.	53.00 to 55.00
Hvy. breakable cast	44.00 to 45.00

## BIRMINGHAM

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$37.00 to \$38.00
No. 2 hvy. melting	37.00 to 38.00
No. 2 bundles	37.00 to 38.00
No. 1 busheling	37.00 to 38.00
Long turnings	23.00 to 24.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	24.00 to 25.00
Bar crops and plate	38.00 to 38.50
Structural and plate	38.00 to 38.50
No. 1 cupola cast.	55.00 to 57.50
Stove plate	50.00 to 51.00
No. 1 RR. hvy. melt.	36.00 to 37.00
Steel axles	38.00 to 39.00
Scrap rails	37.50 to 38.00
Re-rolling rails	52.00 to 54.00
Angles & splice bars	40.00 to 41.00
Rails 3 ft. & under	40.00 to 41.00
Cast iron carwheels	45.00 to 47.50

## YOUNGSTOWN

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$39.50 to \$40.00
No. 2 hvy. melting	39.50 to 40.00
Mach. shop turn.	34.50 to 35.00
Short shov. turn.	36.50 to 37.00
Cast iron borings	35.50 to 36.00
Low phos	47.00 to 47.50

## NEW YORK

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$33.50 to \$37.00
No. 2 hvy. melting	33.50 to 37.00
No. 2 bundles	33.50 to 37.00
Comp. galv. bundles	33.00 to 33.50
Mach. shop turn.	25.00 to 26.00
Mixed bor. & turn.	25.00 to 26.00
Shoveling turn.	28.00 to 29.00
No. 1 cupola cast.	46.00 to 47.00
Hvy. breakable cast.	46.00 to 47.00
Charging box cast.	46.00 to 47.00
Stove plate	46.00 to 47.00
Clean auto cast.	46.00 to 47.00
Unstrip. motor blks.	43.50 to 44.00
C'n chem. cast bor.	33.50 to 34.50

## BUFFALO

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$39.00 to \$40.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	39.00 to 40.00
No. 1 busheling	39.00 to 40.00
Mach. shop turn.	32.50 to 33.50
Shoveling turn.	34.50 to 35.50
Cast iron borings	31.50 to 32.50
Mixed bor. & turn.	31.50 to 32.50
Mixed cupola cast.	50.00 to 52.00
Charging box cast.	48.00 to 50.00
Stove plate	49.00 to 51.00
Clean auto cast.	53.00 to 54.00
RR. Malleable	70.00 to 72.00
Small indl. malleable	47.00 to 49.00
Low phos. plate	46.00 to 49.00
Scrap rails	49.00 to 50.00
Rails 3 ft. & under	52.00 to 54.00
RR. steel wheels	48.00 to 50.00
Cast iron carwheels	48.00 to 50.00
RR. coil & leaf spgs.	48.00 to 50.00
RR. knuckles & coup.	48.00 to 50.00

## CLEVELAND

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$39.00 to \$39.50
No. 2 hvy. melting	39.00 to 39.50
No. 1 bundles	39.00 to 39.50
No. 1 busheling	39.00 to 39.50
Drop forge flashings	39.00 to 39.50
Mach. shop turn.	34.00 to 34.50
Shoveling turn.	36.00 to 36.50
Steel axle turn.	39.00 to 39.50
Cast iron borings	35.00 to 35.50
Mixed bor. & turn.	34.00 to 34.50
Low phos.	44.00 to 44.50
No. 1 machinery cast.	56.00 to 60.00
Malleable	68.00 to 70.00
RR. cast.	58.00 to 60.00
Railroad grate bars	50.00 to 52.00
Stove plate	52.00 to 54.00
RR. hvy. melting	40.00 to 40.50
Rails 3 ft. & under	58.00 to 60.00
Rails 18 in. & under	59.00 to 61.00

## SAN FRANCISCO

Per gross ton f.o.b. shipping point:	
No. 1 hvy. melting	\$25.00
No. 2 hvy. melting	25.00
No. 2 bales	25.00

Per gross ton delivered to consumer:	
No. 3 bales	\$19.50
Mach. shop turn.	16.00
Elec. furn. 1 ft. und.	\$32.00 to 34.00
No. 1 cupola cast.	32.00 to 33.00
RR. hvy. melting	26.00

## LOS ANGELES

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$25.50
No. 2 hvy. melting	25.50
No. 1 bales	25.50
No. 2 bales	25.50
No. 3 bales	19.50
Mach. shop turn.	17.50
No. 1 cupola cast.	\$36.00 to 40.00
RR. hvy. melting	26.50

## SEATTLE

Per gross ton delivered to consumer:	
No. 1 & No. 2 hvy. melt.	\$24.00 to \$26.50
Elec. furn. 1 ft. and und.	27.50 to 30.00
No. 1 cupola cast.	27.50
RR. hvy. melting	25.00 to 26.00

## HAMILTON, ONT.

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point	
Heavy melting	\$22.00*
No. 1 bundles	22.00*
No. 2 bundles	21.50*
Mechanical bundles	20.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	23.00*
Rails, re-rolling	26.00*
Bushelings	17.00*
Bushelings, new fact. prep'd	21.00*
Bushelings, new fact. unprep'd	18.00*
Short steel turnings	17.00*
No. 1 cast	36.00 to 40.00

\*Ceiling Price.



# Comparison of Prices . .

[ Advances over past week in Heavy Type, declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables. ]

Flat-rolled Steel:	Dec. 16, 1947	Dec. 9, 1947	Nov. 18, 1947	Dec. 17, 1946
(cents per pound)	1947	1947	1947	1946
Hot-rolled sheets . . . . .	2.80	2.80	2.80	2.50
Cold-rolled sheets . . . . .	3.55	3.55	3.55	3.20
Galvanized sheets (10 ga.) . . . . .	3.95	3.95	3.95	3.55
Hot-rolled strip . . . . .	2.80	2.80	2.80	2.50
Cold-rolled strip . . . . .	3.55	3.55	3.55	3.20
Plates . . . . .	2.95	2.95	2.95	2.50
Plates wrought iron . . . . .	6.85	6.85	6.85	4.112
Stain's c-r strip (No. 302) . . . . .	30.50	30.50	30.50	30.30
*24 gage				

Tin and Terneplate:	Dec. 16, 1947	Dec. 9, 1947	Nov. 18, 1947	Dec. 17, 1946
(dollars per base box)	1947	1947	1947	1946
Tinplate, standard cokes . . . . .	\$5.75	\$5.75	\$5.75	\$5.00
Tinplate, electro (0.50 lb) . . . . .	5.05	5.05	5.05	4.50
Special coated mfg. ternes . . . . .	4.90	4.90	4.90	4.30

Bars and Shapes:	Dec. 16, 1947	Dec. 9, 1947	Nov. 18, 1947	Dec. 17, 1946
(cents per pound)	1947	1947	1947	1946
Merchant bars . . . . .	2.90	2.90	2.90	2.60
Cold-finished bars . . . . .	3.55	3.55	3.55	3.10
Alloy bars . . . . .	3.30	3.30	3.30	2.92
Structural shapes . . . . .	2.80	2.80	2.80	2.35
Stainless bars (No. 302) . . . . .	26.00	26.00	26.00	25.97
Wrought iron bars . . . . .	7.15	7.15	7.15	4.76

Wire and Wire Products:	Dec. 16, 1947	Dec. 9, 1947	Nov. 18, 1947	Dec. 17, 1946
(cents per pound)	1947	1947	1947	1946
Bright wire . . . . .	3.55	3.55	3.55	3.05
Wire nails . . . . .	4.25	4.25	4.25	3.75

Rails:	Dec. 16, 1947	Dec. 9, 1947	Nov. 18, 1947	Dec. 17, 1946
(dollars per 100 lb)	1947	1947	1947	1946
Heavy rails . . . . .	\$2.75	\$2.75	\$2.75	\$43.39*
Light rails . . . . .	3.10	3.10	3.10	49.18*
*per net ton				

Semifinished Steel:	Dec. 16, 1947	Dec. 9, 1947	Nov. 18, 1947	Dec. 17, 1946
(dollars per gross ton)	1947	1947	1947	1946
Rerolling billets . . . . .	\$45.00	\$45.00	\$45.00	\$39.00
Sheet bars . . . . .	66.00	66.00	66.00	38.00
Slabs, rerolling . . . . .	45.00	45.00	45.00	39.00
Forging Billets . . . . .	55.00	55.00	55.00	47.00
Alloy blooms, billets slabs . . . . .	66.00	66.00	66.00	58.43

Wire Rods and Skelp:	Dec. 16, 1947	Dec. 9, 1947	Nov. 18, 1947	Dec. 17, 1946
(cents per pound)	1947	1947	1947	1946
Wire rods . . . . .	2.80	2.80	2.80	2.30
Skelp . . . . .	2.60	2.60	2.60	2.05

Pig Iron:	Dec. 16, 1947	Dec. 9, 1947	Nov. 18, 1947	Dec. 17, 1946
(per gross ton)	1947	1947	1947	1946
No. 2, foundry, Phila. . . . .	\$40.97	\$40.97	\$40.97	\$32.43
No. 2, Valley furnace . . . . .	36.50	36.50	36.50	30.50
No. 2, Southern Cin'ti. . . . .	40.24	40.24	40.24	29.80
No. 2, Birmingham . . . . .	34.88	34.88	34.88	26.88
No. 2, foundry, Chicago† . . . . .	36.00	36.00	36.00	30.50
Basic del'd Philadelphia . . . . .	40.47	40.47	40.47	31.93
Basic, Valley furnace . . . . .	36.00	36.00	36.00	30.00
Malleable, Chicago† . . . . .	36.50	36.50	36.50	30.50
Malleable, Valley . . . . .	36.50	36.50	36.50	30.50
Charcoal, Chicago . . . . .	56.04	56.04	56.04	42.34
Ferromanganese‡ . . . . .	145.00	145.00	145.00	135.00

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.  
‡ For carlots at seaboard.

Scrap:	Dec. 16, 1947	Dec. 9, 1947	Nov. 18, 1947	Dec. 17, 1946
(per gross ton)	1947	1947	1947	1946
Heavy melt'g steel, P'gh. . . . .	\$40.00	\$40.00	\$42.50	\$30.25
Heavy melt'g steel, Phila. . . . .	40.50	42.00	42.50	29.00
Heavy melt'g steel, Ch'go . . . . .	38.75	38.75	38.75	25.25
No. 1, hy. comp. sheet, Det. . . . .	34.75	34.75	34.75	22.32
Low phos. Youngs'n. . . . .	47.25	47.25	46.25	32.75
No. 1, cast, Pittsburgh . . . . .	53.50	53.50	48.50	35.00
No. 1, cast, Philadelphia . . . . .	53.50	53.50	53.00	40.50
No. 1, cast, Chicago . . . . .	63.50	58.50	52.50	39.75

Coke, Connellsville:	Dec. 16, 1947	Dec. 9, 1947	Nov. 18, 1947	Dec. 17, 1946
(per net ton at oven)	1947	1947	1947	1946
Furnace coke, prompt . . . . .	\$12.50	\$12.50	\$12.50	\$8.75
Foundry coke, prompt . . . . .	14.00	14.00	14.00	8.50

Nonferrous Metals:	Dec. 16, 1947	Dec. 9, 1947	Nov. 18, 1947	Dec. 17, 1946
(cents per pound to large buyers)	1947	1947	1947	1946
Copper, electro., Conn. . . . .	21.50	21.50	21.50	19.50
Copper, Lake, Conn. . . . .	21.625	21.625	21.625	19.625
Tin, Straits, New York . . . . .	80.00	80.00	80.00	70.00
Zinc, East St. Louis . . . . .	10.50	10.50	10.50	10.50
Lead, St. Louis . . . . .	14.80	14.80	14.80	12.35
Aluminum, virgin . . . . .	15.00	15.00	15.00	15.00
Nickel, electrolytic . . . . .	37.67	37.67	37.67	35.00
Magnesium, ingot . . . . .	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex. . . . .	33.00	33.00	33.00	23.50

[ Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled. ]

# Composite Prices . .

FINISHED STEEL				PIG IRON				SCRAP STEEL			
Dec 16, 1947.....	3.18925¢	per lb.....	.....	\$36.96	per gross ton.....	.....	\$39.75	per gross ton.....	.....		
One week ago .....	3.18925¢	per lb.....	.....	\$36.96	per gross ton.....	.....	\$40.25	per gross ton.....	.....		
One month ago .....	3.18925¢	per lb.....	.....	\$36.96	per gross ton.....	.....	\$41.25	per gross ton.....	.....		
One year ago .....	2.75655¢	per lb.....	.....	\$30.14	per gross ton.....	.....	\$28.17	per gross ton.....	.....		
HIGH		LOW		HIGH		LOW		HIGH		LOW	
1947....	3.18925¢ Aug. 12	2.87118¢ Jan. 7	\$37.35 Aug. 10	\$30.14 Jan. 7	\$42.58 Oct. 28	\$29.50 May 20					
1946....	2.83599¢ Dec. 31	2.54490¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1					
1945....	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22					
1944....	2.30837¢ Sept. 5	2.21189¢ Oct. 5	\$23.61	\$23.61	19.17 Jan. 11	15.76 Oct. 24					
1943....	2.29176¢	2.29176¢	23.61	23.61	\$19.17	\$19.17					
1941....	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17					
1940....	2.43078¢	2.43078¢	\$23.61 Mar. 20	\$23.45 Jan. 2	\$22.00 Jan. 7	\$19.17 Apr. 10					
1939....	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9					
1938....	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16					
1937....	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7					
1936....	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9					
1935....	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8					
1934....	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29					
1933....	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25					
1932....	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3					
1931....	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5					
1930....	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29					
1929....	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9					
	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8					

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

# Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 8 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb & over, (9) Carload lot in manufacturing trade. (10) Delivered Los Angeles only. (11) Produced to dimensional tolerances in AISI Manual Sec. 6. (12) Delivered San Francisco only; includes 3 pct freight tax. (13) Delivered Kaiser Co. prices; includes 3 pct freight tax. (14) to 0.035 to 0.075 in. thick by 3/4 to 3 1/2 in. wide. (15) Spot market as high as \$92 gross ton or higher. (16) Delivered Los Angeles; add 1/2¢ per 100 lb for San Francisco. (17) Slab prices subject to negotiation in most cases. Some producers charge (18) \$2 more, (19) \$1 more. Some producers charge (20) 0.05¢ less, (21) 0.10¢ less, (22) 0.20¢ less.

Basing Points	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	San Franc'co, Los Angeles, Seattle	DELIVERED TO		
												Detroit	New York	Phila- delphia
INGOTS														
Carbon, re-rolling														
Carbon, forging	\$46.00													
Alloy	\$56.00													
BILLETS, BLOOMS, SLABS														
Carbon, re-rolling 18	\$45.00 <sup>19</sup>	\$45.00 <sup>19</sup>	\$45.00 <sup>19</sup>	\$47.00	\$45.00 <sup>19</sup>	\$45.00 <sup>19</sup>							\$48.00 <sup>19</sup>	
Carbon, forging billets	\$55.00	\$55.00	\$55.00	\$55.00	\$55.00	\$55.00							\$58.00	
Alloy	\$66.00	\$66.00				\$66.00							\$69.00	
SHEET BARS <sup>16</sup>							\$86.00							
PIPE SKELP	2.60¢ <sup>21</sup>	2.65¢					2.60¢ <sup>21</sup>							
WIRE RODS	2.80¢ <sup>21</sup>	2.80¢ <sup>21</sup>		2.80¢ <sup>21</sup>	2.85¢								3.52¢ <sup>13</sup>	
SHEETS														
Hot-rolled	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢			(Ashland, Ky. = 2.80¢)	3.54 <sup>17</sup> ¢	2.95¢	3.12¢ 3.02¢
Cold-rolled <sup>1</sup>	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢	3.55¢		3.65¢	3.55¢			3.70¢	4.00¢ 3.97¢
Galvanized (10 gage)	3.95¢ <sup>23</sup>	3.95¢ <sup>23</sup>	3.95¢ <sup>23</sup>		3.95¢ <sup>23</sup>		3.95¢	3.95¢	4.05¢	3.95¢	(Ashland = 3.95¢)	4.82 <sup>17</sup> ¢		4.27¢ 4.17¢
Enameling (12 gage)	3.95¢ <sup>22</sup>	3.95¢ <sup>22</sup>	3.95¢ <sup>22</sup>	3.95¢			3.95¢		4.05¢	3.95¢			4.10¢ <sup>23</sup>	4.42¢ 4.37¢
Long ternes <sup>2</sup> (10 gage)	4.05¢ <sup>24</sup>	4.05¢ <sup>24</sup>	3.85¢											4.52¢ 4.47¢
STRIP														
Hot-rolled <sup>3</sup>	2.80¢	2.80¢	2.80¢	2.80¢ <sup>15</sup>	2.80¢		2.80¢					3.60¢ <sup>17</sup>	2.95¢	3.27¢ 3.22¢
Cold-rolled <sup>4</sup>	3.55¢	3.65¢		3.55¢			3.55¢				(Worcester = 3.75¢)		3.70¢	4.02¢ 3.97¢
Cooperage stock	3.10¢	3.10¢			3.10¢		3.10¢							3.57¢
TINPLATE														
Standard cokes, base box	\$5.75	\$5.75	\$5.75		\$5.85			\$5.85	\$5.85			(Warren, Ohio = \$5.75)	\$6.175	\$6.074
Electro, box	(0.25 lb. 0.50 lb. 0.75 lb.)													
BLACKPLATE, 29 gage <sup>5</sup>	3.90¢	3.90¢	3.90¢		4.00¢			4.00¢	4.00¢					4.32¢ 4.22¢
BLACKPLATE, CANMAKING														
55 lb. to 70 lb. 75 lb. to 95 lb. 100 lb. to 118 lb.														
TERNES, MFG., Special coated														
BARs														
Carbon steel	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢					3.625¢ <sup>17</sup>	3.05¢	3.35¢ 3.32¢
Rail steel <sup>6</sup>	Subject to negotiation because of fluctuating scrap prices.													
Reinforcing (billet) <sup>7</sup>	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢				3.325¢ <sup>17</sup>	3.07¢	2.97¢
Reinforcing (rail)	Subject to negotiation because of fluctuating scrap prices.													
Cold-finished <sup>8</sup>	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢							3.70¢	4.00¢ 3.97¢
Alloy, hot-rolled	3.30¢	3.30¢				3.30¢	3.30¢				(Bethlehem, Massillon, Canton = 3.30¢)		3.45¢	3.45¢
Alloy, cold-drawn	4.10¢	4.10¢	4.10¢	4.10¢		4.10¢							4.25¢	
PLATE														
Carbon steel <sup>12</sup>	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢		2.95¢				(Coatesville = 3.15¢, Claymont = 3.30¢, Geneva, Utah = 3.10¢)	3.76¢ <sup>14</sup>		3.27¢ 3.17¢
Floor plates	4.20¢	4.20¢												4.67¢ 4.62¢
Alloy	3.80¢	3.80¢												4.27¢ 4.22¢
SHAPES, Structural	2.80¢	2.80¢	2.80¢		2.80¢	2.80¢					(Geneva, Utah = 2.95¢, Bethlehem = 2.80¢)	3.43¢ <sup>10</sup>		3.02¢ 2.95¢
SPRING STEEL, C-R														
0.08 to 0.40 carbon	3.55¢			3.55¢							(Worcester = 3.75¢)			
0.41 to 0.60 carbon	5.05¢			5.05¢							(Worcester = 5.25¢)			
0.61 to 0.80 carbon	5.65¢			5.65¢							(Worcester = 5.85¢)			
0.81 to 1.05 carbon	7.15¢			7.15¢							(Worcester = 7.35¢)			
1.06 to 1.35 carbon	9.45¢			9.45¢							(Worcester = 9.65¢)			
MANUFACTURERS' WIRE <sup>9</sup>														
Bright	3.55¢	3.55¢		3.55¢	3.55¢						(Worcester = 3.65¢, Duluth = 3.60¢)	4.56¢ <sup>13</sup>		3.99¢ 3.97¢
Galvanized											Add proper size extra and galvanizing extra to Bright Wire Base			
Spring (high carbon)	4.60¢	4.60¢		4.60¢							(Worcester = 4.70¢, Duluth = 4.85¢) (Trenton = 4.85¢)	5.28¢ <sup>13</sup>		5.04¢ 4.96¢
PILING, Steel sheet	3.30¢	3.30¢				3.30¢								3.75¢ 3.72¢



## CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 438	No. 442	No. 448
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation					
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.	Subject to negotiation					
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	Subject to negotiation					
Billets, P'gh, Chi, Canton, Watervliet, Syracuse, Balt., Beth.	Subject to negotiation					
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville, Beth.	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville, Beth.	27.50	28.00	20.50	21.00	24.50	30.00
Bars, c-r, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet, Beth.	27.50	28.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi	27.50	28.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt.	39.00	37.00	29.00	31.50	38.50	38.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.50	23.50	18.50	19.00	28.00	38.00
Strip, c-r, P'gh, Cleve, Jersey City, Reading, Canton, Youngstown	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila, Ft. Wayne	27.50	28.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton	32.48	30.30	23.80	24.34	34.82	56.28
Rod, h-r, Syracuse	27.05	25.97	20.02	20.56	24.34	29.78
Tubing, seamless, P'gh, Chi, Canton (4 to 8 in.)	72.09	72.09		98.49		

## TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. \*Also Canton, Ohio)

W	Cr	V	Mo	Co	Base Per lb
18	4	1	—	—	82¢
18	4	1	—	5	\$1.29
18	4	2	—	—	93¢
1.5	4	1.5	8	—	69¢
6	4	2	6	—	63¢
High-carbon-chromium*					47¢
Oil hardening manganese*					26¢
Special carbon*					24¢
Extra carbon*					20¢
Regular carbon*					17¢

Warehouse prices on and east of Mississippi are 2¢ per lb. higher; west of Mississippi, 4¢ higher.

## ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Field grade	4.50¢
Armature	4.80¢
Electrical	5.30¢
Motor	6.05¢
Dynamo	6.75¢
Transformer 72	7.25¢
Transformer 65	7.95¢
Transformer 58	8.65¢
Transformer 52	9.45¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo.

## RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb No. 1 O.H., per 100 lb	\$2.75
Angle splice bars, 100 lb (F.o.b. basing points) per 100 lb	3.25
Light rails (from billets)	\$3.10
Light rails (from rail steel), f.o.b. Williamsport, Pa.	3.45

Base per lb

Cut spikes	4.85¢
Screw spikes	6.90¢
Tie plate, steel	3.05¢
Tie plates, Pittsburgh, Calif.	3.20¢
Track bolts	7.00¢
Track bolts, heat treated, to rail roads	7.25¢

Basing points, light rails, Pittsburgh, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, St. Louis Kansas City, Minnequa, Colo.; Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa.; Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa.; Richmond.

## ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.	\$7.05	\$14.10

## CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless-clad		
No. 304, 20 pct. f.o.b. Pittsburgh, Washington, Coatesville, Pa.	\$24.00	\$22.00
Nickel-clad		
10 pct. f.o.b. Coatesville, Pa.	21.50	....
Inconel-clad		
10 pct. f.o.b. Coatesville	30.00	....
Monel-clad		
10 pct. f.o.b. Coatesville	29.00	....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

\* Includes annealing and pickling, or sandblasting.

## MERCHANT WIRE PRODUCTS

To the dealer f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Base Delivered per 100 lb San Francisco
Standard & coated nails	\$4.25†
Galvanized nails††	4.00†
Cut nails, carloads, Pittsburgh base	5.80*

† 10¢ additional at Cleveland, 35¢ at Worcester. †† Plus \$2.75 per 100 lb galvanizing extra. \*Less 20¢ to jobbers.

	Base per 100 lb
Annealed fence wire	\$4.20†
Annealed galv. fence wire	4.65†

To the dealer f.o.b. Pittsburgh, Chicago, Birmingham

	Base column
Woven wire fence*	91
Fence posts, carloads...	90††
Single loop bale ties	91
Galvanized barbed wire**	101
Twisted barless wire...	101

\* 15½ gage and heavier. \*\* On 80-rod spools in carload quantities. †† Pittsburgh, Duluth.

## HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Aldcor	Corten	Double Strength No. 1	Dynalloy	Hi Steel	Mayar R	Otiscoloy	Yoloy	NAX High Tensile
Producer	Repub-lic	Carnegie-Illinois, Republic	Repub-lic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55
Sheets									
Hot-rolled	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Cold-rolled	5.30	5.30	5.30	....	5.30	5.30	5.30	5.30	5.30
Galvanized	....	5.85	....	....	....	6.00	....	....	....
Strip									
Hot-rolled	4.30	4.30	4.30	....	4.30	4.30	4.30	4.30	4.30
Cold-rolled	....	....	5.30	....	....	5.30	5.30	5.30	5.30†
Shapes	....	4.30	....	....	4.30	4.30	4.30	4.30	....
Beams	....	4.30	....	....	....	4.30	....	....	....
Bars									
Hot-rolled	4.45	4.45	4.45	....	....	4.45	4.45	4.45	4.45
Cold-rolled	....	....	....	....	....	....	....	....	....
Bar shapes	....	4.45	....	....	4.45	4.45	4.45	4.45	....

† Pittsburgh, add 0.10¢ at Chicago and Gary.

## PRICES

### PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh and Lorain, steel butt-weld and seamless. Others f.o.b. Pittsburgh only. Base price, \$200.00 per net ton. **Standard, threaded & coupled**

Steel, butt-weld	Black	Galv.
1/2-in. ....	50 1/2	34 1/2
3/4-in. ....	53 1/2	38 1/2
1-in. ....	56	41 1/2
1 1/4-in. ....	56 1/2	42
1 1/2-in. ....	57	42 1/2
2-in. ....	57 1/2	43
2 1/2 and 3-in. ....	58	43 1/2
Wrought iron, butt-weld		
1/2-in. ....	+ 7	+ 29
3/4-in. ....	2 1/2	+ 19
1 and 1 1/4-in. ....	8	+ 11
1 1/2-in. ....	13 1/2	+ 7 1/2
2-in. ....	14	+ 7

Steel, lap-weld		
2-in. ....	49	34
2 1/2 and 3-in. ....	52	37
3 1/2 to 6-in. ....	54	39
Steel, seamless		
2-in. ....	48	33
2 1/2 and 3-in. ....	51	36
3 1/2 to 6-in. ....	53	38

Wrought iron, lap-weld		
2-in. ....	5 1/2	+ 14 1/2
2 1/2 to 3 1/2-in. ....	8	+ 10 1/2
4-in. ....	12	+ 5
4 1/2 to 8-in. ....	10	+ 6 1/2

#### Extra Strong, plain ends

Steel, butt-weld		
1/2-in. ....	49 1/2	35
3/4-in. ....	53 1/2	39
1-in. ....	56 1/2	42
1 1/4-in. ....	56	42 1/2
1 1/2-in. ....	56 1/2	43
2-in. ....	57	43 1/2
2 1/2 and 3-in. ....	57 1/2	44
Wrought iron, butt-weld		
1/2-in. ....	+ 2 1/2	+ 23
3/4-in. ....	3 1/2	+ 17
1 to 2-in. ....	13	+ 7

Steel, lap-weld		
2-in. ....	48	34
2 1/2 and 3-in. ....	52	38
3 1/2 to 6-in. ....	55 1/2	41 1/2
Steel, seamless		
2-in. ....	47	33
2 1/2 and 3-in. ....	51	37
3 1/2 to 6-in. ....	54 1/2	40 1/2

Wrought iron, lap-weld		
2-in. ....	8 1/2	+ 11
2 1/2 to 4-in. ....	17 1/2	+ 1 1/2
4 1/2 to 6-in. ....	13	+ 5

Basing discounts for standard pipe are for threads and couplings. For threads only, butt-weld, lap-weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt-weld, lap-weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap-weld and seamless 3 1/4-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all butt-weld. On butt-weld and lap-weld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

### BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft, f.o.b. Pittsburgh in carload lots, out length 4 to 24 ft, inclusive.

OD	Gage	Hot-rolled	Cold-drawn	Electric Weld Hot-rolled	Electric Weld Cold-drawn
2	13	\$16.67	\$19.99	\$16.17	\$19.39
2 1/2	12	22.42	26.87	21.75	26.06
3	12	24.93	29.90	24.18	29.00
3 1/2	11	31.17	37.39	30.23	36.27
4	10	38.69	46.38	37.53	44.99

### CAST IRON WATER PIPE

	Per net ton
6-in. to 24-in. del'd Chicago ....	\$36.12
6-in. to 24-in. del'd New York ....	84.18
6-in. to 24-in., Birmingham ....	74.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles for all rail shipment; rail and water shipment less ....	100.90
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

### BOLTS, NUTS, RIVETS, SET SCREWS

#### Consumer Prices

(Bolts and nuts f.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

#### Machine and Carriage Bolts

	Percent Off List
1/2 in. & smaller x 6 in. & shorter ..	45
9/16 & 5/8 in. x 6 in. & shorter ..	46
3/4 in. & larger x 6 in. & shorter ..	43
All diam, longer than 6 in. ....	41
Lag, all diam over 6 in. long ..	44
Lag, all diam x 6 in. & shorter ..	46
Plow bolts ..	54

#### Nuts, Cold Punched or Hot Pressed

	(Hexagon or Square)
1/2 in. and smaller ..	43
9/16 to 1 in. inclusive ..	42
1 1/4 to 1 1/2 in. inclusive ..	40
1 1/2 in. and larger ..	35
On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.	

#### Semifin. Hexagon Nuts USS SAE

	USS	SAE
7/16 in. and smaller ..	46	
1/2 in. and smaller ..	44	
3/4 in. through 1 in. ....	44	
9/16 in. through 1 in. ....	43	
1 1/4 in. through 1 1/2 in. ....	41	42
1 1/2 in. and larger ..	35	

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

#### Stove Bolts

Packages, nuts separate ....	65 and 10
In bulk ..	75
On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.	

#### Large Rivets (1/2 in. and larger)

	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham ..	\$5.65
F.o.b. Lebanon, Pa. ....	5.80

#### Small Rivets (7/16 in. and smaller)

	Percent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham ..	55

#### Cap and Set Screws

	Percent Off List
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright ..	53
1/2 to 1 in. x 6 in., SAE 1035, heat treated ..	44
Set screws, oval points ..	56
Milled studs ..	29
Flat head cap screws, listed sizes ..	16
Fillister head cap, listed sizes ..	37
Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.	

### FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF <sub>2</sub> Content:	Base price per short ton
70% or more ..	\$35.00
65% but less than 70% ..	34.00
60% but less than 65% ..	33.00
Less than 60% ..	32.00

### LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer ..	\$5.95
Old range, nonbessemer ..	5.80
Mesabi, bessemer ..	5.70
Mesabi, nonbessemer ..	5.55
High phosphorus ..	5.55
Prices quoted retroactive to Jan. 1, 1947.	

### METAL POWDERS

Prices in cents per pound in ton lots, f.o.b. shipping point.

Brass, minus 100 mesh ..	24¢ to 28 1/2¢
Copper, electrolytic, 100 and 325 mesh ..	30¢ to 31 1/2¢
Copper, reduced, 150 and 300 mesh ..	29¢ to 30 1/2¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe carlots ..	10¢ to 17¢
Swedish sponge iron, 100 mesh, c.l.f. N. Y., carlots, ocean bags ..	7.4¢ to 8.5¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots ..	8¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots ..	63¢ to 80¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe ..	35¢ to 37¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe ..	29¢ to 32¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe ..	90¢ to \$1.75
Aluminum, 100, 200 mesh, carlots ..	23¢ to 26¢
Antimony, 100 mesh ..	36.05¢
Cadmium, 100 mesh ..	\$2.00
Chromium, 100 mesh and finer ..	\$1.025
Lead, 100, 200, & 300 mesh 18.50¢ to 23.50¢	
Manganese, minus 325 mesh and coarser ..	49¢
Nickel, 100 mesh ..	51 1/2¢
Silicon, 100 mesh ..	26¢
Solder powder, 100 mesh ..	8 1/2¢ plus metal
Stainless steel, 302, minus 100 mesh ..	75¢
Tin, 100 mesh ..	90¢
Tungsten metal powder, 98% - 99%, any quantity, per lb. ....	\$3.00
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb. ....	\$2.85
Under 100 lb ..	\$2.90

### COKE

Furnace, beehive (f.o.b. oven) Net Ton	
Connellsville, Pa. ....	\$12.00 to \$13.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa. ....	13.50 to 14.50
Foundry, Byproduct	
Chicago, del'd ..	\$18.60
Chicago, f.o.b. ....	17.50
New England, del'd ..	19.75
Seaboard, Kearney, N. J., f.o.b. ....	17.85
Philadelphia, del'd ..	17.82
Swedeland, Pa., f.o.b. ....	16.90
Buffalo, del'd ..	18.75
Ashland, Ohio, f.o.b. ....	15.50
Painesville, Ohio, f.o.b. ....	16.40
Erie, del'd ..	19.95
Cleveland, del'd ..	17.90
Cincinnati, del'd ..	18.59
St. Louis, del'd ..	18.03
Birmingham, del'd ..	15.76

### REFRACTORIES

(F.o.b. Works)

#### Fire Clay Brick

	Carload, Per 1000
No. 1, Ohio ..	\$67.00
First quality, Pa., Md., Ky., Mo., Ohio ..	73.00
First quality, New Jersey ..	78.00
Sec. quality, Pa., Md., Ky., Mo., Ohio ..	67.00
Sec. quality, New Jersey ..	70.00
No. 2, Ohio ..	59.00
Ground fire clay, net ton, bulk ..	10.50

#### Silica Brick

Pennsylvania and Birmingham ..	\$73.00
Chicago District and Alabama ..	82.00
Silica cement, net ton (Eastern) ..	12.50
East Chicago ..	13.50

#### Chrome Brick

	Per Net Ton
Standard chemically bonded, Balt. ....	
Plymouth Meeting, Chester ..	\$64.00

#### Magnesite Brick

Standard, Balt. and Chester ..	\$86.00
Chemically bonded, Baltimore ..	75.00

#### Grain Magnesite

Domestic, f.o.b. Balt. and Chester in bulk ..	\$46.50
Domestic, f.o.b. Chewelah, Wash., in bulk ..	34.00
In sacks ..	38.00

#### Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk, Midwest; add 10¢; Missouri Valley; add 20¢ ..	\$11.00
---	---------



# PRICES

## WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia.....	\$4.47	\$5.73	\$5.82	\$4.78	\$5.68	\$4.82	\$4.55	\$4.83	\$5.53	\$8.34	\$8.44	\$9.88	\$9.95
New York.....	4.71	5.72 <sup>1</sup>	6.11	5.03	5.86	5.06	4.75	5.02	5.57	8.40	8.50	9.92	10.02
Boston.....	4.76	5.63 <sup>1</sup>	6.18 <sup>1</sup>	4.76	5.73	5.11	4.82	4.98	5.63	8.62	8.72	9.98	10.08
Baltimore.....	4.31	.....	5.71	4.76	.....	4.76	4.68	4.81	5.51	.....	.....	.....	.....
Norfolk.....	4.80	.....	.....	5.20	.....	5.05	5.05	5.10	5.90	.....	.....	.....	.....
Chicago.....	4.25	5.10	5.65	4.35	5.45	4.60	4.40	4.40	5.10	8.05	8.15	9.30	9.40
Milwaukee.....	4.429	5.279 <sup>1</sup>	5.829	4.529	5.629 <sup>5</sup>	4.779	4.579	4.579	5.279	8.379	8.479	9.629	9.729
Cleveland.....	4.25	4.95	5.78	4.52	5.00	4.60 <sup>1</sup>	4.65	4.40	5.10	8.33	8.43	9.30	9.40
Buffalo.....	4.25	5.10	5.60	4.70	5.65 <sup>5</sup>	4.95	4.40 <sup>1</sup>	4.40 <sup>1</sup>	5.10	8.05	8.15	9.30	9.40
Detroit.....	4.35	5.20	5.02	4.72	5.63	4.88 <sup>1</sup>	4.77	4.50	5.22	8.50	8.60	9.73	9.78
Cincinnati.....	4.51	5.19	5.74	4.74	5.70	4.95	4.79	4.75	5.45	.....	.....	.....	.....
St. Louis.....	4.58	5.43 <sup>1</sup>	5.87	4.68	5.82	4.88	4.73	4.73	5.47	8.57	8.67	9.82	9.92
Pittsburgh.....	4.25	5.10 <sup>1</sup>	5.65	4.35	.....	4.60	4.40	4.40	5.10	8.05	8.15	9.30	9.40
St. Paul.....	4.63	5.48 <sup>1</sup>	5.88 <sup>2</sup>	4.73 <sup>7</sup>	.....	4.93 <sup>7</sup>	4.78 <sup>7</sup>	4.78 <sup>7</sup>	5.91 <sup>6</sup>	.....	.....	.....	.....
Omaha.....	4.868	6.118 <sup>1</sup>	6.468	5.168	.....	5.418	5.218	5.218	6.018	.....	.....	.....	.....
Indianapolis.....	4.583	5.324	5.874	4.683	5.763	4.903	4.703	4.703	5.403	.....	.....	.....	.....
Birmingham.....	4.45 <sup>11</sup>	.....	5.85	4.45 <sup>11</sup>	.....	4.65 <sup>11</sup>	4.40 <sup>11</sup>	4.40 <sup>11</sup>	6.04	.....	.....	.....	.....
Memphis.....	4.82 <sup>11</sup>	5.87 <sup>1</sup>	6.37	5.02 <sup>11</sup>	.....	5.17 <sup>11</sup>	4.97 <sup>11</sup>	4.97 <sup>11</sup>	5.87	.....	.....	.....	.....
New Orleans.....	*4.98 <sup>11</sup>	6.29 <sup>1</sup>	.....	5.18 <sup>11</sup>	.....	5.33 <sup>11</sup>	*5.03 <sup>11</sup>	*5.13 <sup>11</sup>	6.29 <sup>6</sup>	.....	.....	.....	.....
Houston.....	5.30	.....	6.60	5.25	.....	5.35	5.15	5.30	6.80	9.40 <sup>17</sup>	9.20 <sup>17</sup>	10.35 <sup>17</sup>	10.45 <sup>17</sup>
Los Angeles.....	5.75	7.35 <sup>1</sup>	7.40	6.05	8.70 <sup>5</sup>	5.65	5.35	5.50	7.35 <sup>14</sup>	9.55 <sup>15</sup>	9.35 <sup>15</sup>	10.95 <sup>15</sup>	11.05 <sup>15</sup>
San Francisco.....	5.40 <sup>8</sup>	6.65	6.85	5.75 <sup>8</sup>	.....	5.50	5.20	5.05	7.50 <sup>10</sup>	9.55 <sup>15</sup>	9.35 <sup>15</sup>	10.95 <sup>15</sup>	11.05 <sup>15</sup>
Seattle.....	5.45 <sup>4</sup>	7.25 <sup>2</sup>	6.85	5.60 <sup>4</sup>	.....	5.60 <sup>4</sup>	5.25 <sup>4</sup>	5.45 <sup>4</sup>	7.45 <sup>14</sup>	.....	8.55 <sup>16</sup>	.....	11.15 <sup>16</sup>
Portland.....	5.30 <sup>4</sup>	7.10 <sup>2</sup>	6.70	5.60 <sup>4</sup>	.....	5.45 <sup>4</sup>	5.25 <sup>4</sup>	5.55 <sup>4</sup>	7.45 <sup>14</sup>	.....	.....	.....	.....
Salt Lake City.....	6.40	.....	7.85	6.70	.....	6.20	6.35	6.65	7.55	.....	.....	.....	.....

## BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb:

strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 450 to 1499 lb; (10) 500 to 999 lb;

(11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) 1000 to 1999 lb.

\* Add 46¢ for sizes not rolled in Birmingham.

† Up to ¾ in. thick and 90 in. wide.

‡ Add 35¢ for sizes not rolled at Buffalo.

## PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

BASING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem.....	37.00	37.50	38.00	38.50	.....	Boston.....	Everett.....	\$0.50 Arb.	.....	45.50	46.00	.....	.....
Birmingham.....	32.88	33.38	.....	.....	.....	Boston.....	Steelton.....	5.30	.....	.....	.....	.....	47.30
.....	35.88	36.38	.....	.....	.....	Brooklyn.....	Bethlehem.....	3.30	40.30	40.80	41.30	41.80	.....
Buffalo.....	38.00	38.00	36.50	.....	.....	Cincinnati.....	Birmingham.....	5.38	38.24	38.74	.....	.....	.....
.....	39.50 <sup>*</sup>	40.00 <sup>*</sup>	40.50 <sup>*</sup>	.....	.....	.....	.....	.....	41.25	41.74	.....	.....	.....
Chicago.....	35.50	36.00	36.50	37.00	.....	Jersey City.....	Bethlehem.....	2.02	39.02	39.52	40.02	40.52	.....
Cleveland.....	35.50	36.00	36.50	.....	.....	Los Angeles.....	Provo.....	6.53	42.53	43.03	.....	.....	.....
.....	39.25 <sup>*</sup>	39.75 <sup>*</sup>	40.25 <sup>*</sup>	.....	.....	Mansfield.....	Cleveland-Toledo.....	2.86	38.06	38.56	39.06	39.56	.....
Duluth.....	36.00	36.50	37.00	37.50	.....	.....	.....	.....	41.81 <sup>*</sup>	42.31 <sup>*</sup>	42.81 <sup>*</sup>	.....	.....
Erie.....	35.50	36.00	36.50	37.00	.....	Philadelphia.....	Bethlehem.....	1.84	38.84	39.34	39.84	40.34	.....
Everett.....	.....	45.00	45.50	.....	.....	Philadelphia.....	Swedeland.....	1.11	42.11	42.61	43.11	43.61	.....
Granite City.....	36.50	37.00	37.00	.....	.....	Philadelphia.....	Steelton.....	2.38	39.38	.....	.....	.....	44.38
Neville Island.....	36.00	36.50	36.50	37.00	.....	San Francisco.....	Provo.....	6.53	42.53	43.03	.....	.....	.....
Provo.....	36.00	36.50	.....	.....	.....	Seattle.....	Provo.....	6.53	42.53	43.03	.....	.....	.....
Sharpsville.....	36.00	36.50	36.50	37.00	.....	St. Louis.....	Granite City.....	0.75 Arb.	37.25	37.75	37.75	.....	.....
Steelton.....	37.00	.....	.....	.....	42.00	.....	.....	.....	.....	.....	.....	.....	.....
Struthers, Ohio.....	36.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Swedeland.....	41.00	41.50	42.00	42.50	.....	.....	.....	.....	.....	.....	.....	.....	.....
Toledo.....	35.50	36.00	36.50	37.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
Troy, N. Y.....	37.00	37.50	38.00	38.50	42.00	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown.....	36.00	36.50	36.50	37.00	.....	.....	.....	.....	.....	.....	.....	.....	.....

\* Republic Steel Corp. price. Basis: Average price of No. 1 hvy. mlt. steel scrap at Cleveland or Buffalo respectively as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00

pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—\$45.50; f.o.b. Buffalo—\$46.75. Add \$1.25 per ton for each additional 0.50 pct Si, up to 12 pct. Add 50¢ per ton for each 0.50 pct

Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorous \$50.00 per gross ton, f.o.b. Lyles, Tenn. Delivered Chicago, \$56.04. High phosphorous charcoal pig iron is not being produced.

# FERROALLOY PRICES

## Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.  
 Carload lots (bulk) ..... \$145  
 Less ton lots (packed) ..... 189  
 Delivered Pittsburgh ..... 151  
 \$1.80 for each 1% above 82% Mn;  
 penalty, \$1.80 for each 1% below 78%.

## Briquets

Cents per pound of briquet, freight allowed, 66% contained Mn.  
 Eastern Central Western  
 Carload, bulk .. 8.70 8.95 9.50  
 Ton lots ..... 10.30 10.90 12.80  
 Less ton lots .. 11.20 11.80 13.70

## Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.  
 16-19% Mn 19-21% Mn  
 3% max. Si 3% max. Si  
 Carloads ..... \$46.00 \$47.00  
 F.o.b. Pittsburgh 50.00 51.00

## Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.  
 96% min. mn, 0.2% max. C, 1% max. Si, 2% max. Fe.  
 Carload, bulk ..... 31  
 L.c.l. lots ..... 34

## Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed, east of Mississippi, cents per pound.  
 Carloads ..... 31  
 Ton lots ..... 34  
 Less ton lots ..... 36

## Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.  
 Carloads Ton Less  
 0.07% max. C, 0.06% P, 90% mn. .... 23.00 24.85 26.05  
 0.10% max. C ..... 22.50 24.35 25.55  
 0.15% max. C ..... 22.00 23.85 25.05  
 0.30% max. C ..... 21.50 23.35 24.55  
 0.50% max. C ..... 21.00 22.85 24.05  
 0.75% max. C ..... 18.00 19.85 21.05

## Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.  
 Carload, bulk ..... 7.80  
 Ton lots ..... 9.45

## Briquets

Contract basis, carlots, bulk freight allowed, per lb of briquet.. 8.75  
 Ton lots ..... 10.35  
 Less ton lots ..... 11.25

## Silvery Iron (electric furnace)

Si 14.01 to 14.50%, \$73.00 f.o.b. Keokuk, Iowa; \$73.75 f.o.b. Niagara Falls; \$70.75, f.o.b. Jackson, Ohio. Electric furnace silvery iron is not being produced at Jackson. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add 50¢ per ton for each 0.50 pct Mn over 1 pct.

## Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.  
 Eastern Central Western  
 96% Si, 2% Fe.. 16.90 17.50 18.10  
 97% Si, 1% Fe... 17.30 17.90 18.50

## Silicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si, 1 lb Si briquets.  
 Eastern Central Western  
 Carload, bulk .... 5.25 5.50 5.70  
 Ton lots ..... 6.85 7.45 7.75  
 Less ton lots ..... 7.75 8.35 8.65

## Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.  
 Eastern Central Western  
 25% Si ..... 15.50  
 50% Si ..... 9.30 9.80 10.00  
 75% Si ..... 11.80 12.10 12.85  
 85% Si ..... 13.30 13.60 14.35  
 90% Si ..... 15.00 15.30 16.00

## Ferrochrome (65-72% Cr, 1% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.  
 Eastern Central Western  
 0.06% C ..... 26.50 26.90 27.00  
 0.10% C ..... 26.00 26.40 26.50  
 0.15% C ..... 25.50 25.90 26.00  
 0.20% C ..... 25.25 25.65 25.75  
 0.50% C ..... 25.00 25.40 25.50  
 1.00% C ..... 24.50 24.90 24.75  
 2.00% C ..... 24.25 24.65 24.75  
 65-69% Cr, 4-9% C ..... 18.60 19.00 19.15  
 62-66% Cr, 4-6% C, 6-9% Si ..... 18.60 19.00 19.15

## Briquets

Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.  
 Eastern Central Western  
 Carload, bulk .... 12.50 12.75 12.85  
 Ton lots ..... 14.00 14.90 15.50  
 Less ton lots ..... 14.90 15.80 16.40

## High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% N.

## S M Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.  
 High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.  
 Eastern Central Western  
 Carload ..... 19.70 20.10 20.25  
 Ton lots ..... 21.85 23.15 23.95  
 Less ton lots ..... 23.35 24.65 25.45  
 Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.  
 Eastern Central Western  
 Carload ..... 25.00 25.40 25.50  
 Ton lots ..... 27.30 27.95 29.15  
 Less ton lots ..... 29.10 29.75 30.95

## Chromium Metal

Contract prices, cents per lb, chromium contained, carload, packed, f.o.b. shipping point, freight allowed, 97% min. Cr, 1% max. Fe.  
 Eastern Central Western  
 0.20% max. C .... 97.00 98.50 99.75  
 0.50% max. C .... 93.00 94.50 95.75  
 9.00% min. C ... 91.50 93.00 94.25

## Calcium-Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.  
 30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.  
 Eastern Central Western  
 Carloads ..... 16.25 16.75 18.80  
 Ton lots ..... 19.35 20.10 22.25  
 Less ton lots ..... 20.85 21.60 23.75

## Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.  
 15-20% Ca, 14-18% Mn, 53-59% Si.  
 Eastern Central Western  
 Carloads ..... 17.50 18.00 20.05  
 Ton lots ..... 19.80 20.65 22.40  
 Less ton lots ..... 20.80 21.65 23.40

## Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.  
 Cast Turnings Distilled  
 Ton lots ..... \$1.85 \$2.70 \$3.40  
 Less ton lots ... 2.20 3.05 4.20

## CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.  
 Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.  
 Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.35% Zr, 3.50-5.00% C.  
 Eastern Central Western  
 Ton lots ..... 18.00 19.10 21.05  
 Less ton lots ..... 19.25 20.35 22.30

## SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.  
 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, 1/2 in. x 12 mesh.  
 Eastern Central Western  
 Ton lots ..... 15.75 16.85 18.80  
 Less ton lots ..... 17.00 18.10 20.05

## Other Ferroalloys

Ferrotungsten, standard, lump or 1/2 x down, packed, f.o.b. plant Niagara Falls, Washington, Pa. York, Pa., per pound contained W, 5 ton lots, freight allowed.. \$2.25  
 Ferrovandium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.  
 Openhearth ..... \$2.90  
 Crucible ..... 3.00  
 High speed steel (Primos).. 3.10  
 Vanadium pentoxide, 88-92% V<sub>2</sub>O<sub>5</sub> contract basis, per pound contained V<sub>2</sub> ..... \$1.20  
 Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb  
 Ton lots ..... \$2.50  
 Less ton lots ..... \$2.55  
 Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo. .... 30¢  
 Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo. .... 30¢  
 Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo. .... 30¢  
 Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo. .... 30¢  
 Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y. ton lots, per pound contained Ti \$1.30  
 Less ton lots ..... \$1.31  
 Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti ..... \$1.30  
 Less ton lots ..... \$1.41  
 High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton... \$143.90  
 Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. (Siglo) Tenn., \$3 unitage per gross ton \$66.00  
 Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.  
 Carload lots ..... 18.40¢  
 Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy  
 Carload, bulk ..... 6.00¢  
 Alsiifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.  
 Carload ..... 6.90¢  
 Ton lots ..... 7.40¢  
 Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound Car lots ..... 9.00¢  
 Ton lots ..... 9.75¢  
**Boron Agents**  
 Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.  
 Ferroboreon, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.  
 Eastern Central Western  
 100 lb or more... \$1.20 \$1.23 \$1.21  
**Manganese - Boron 75.00% Mn, 15-18% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.**  
 Ton lots ... \$1.89 \$1.903 \$1.935  
 Less ton lots 2.01 2.023 2.044  
**Nickel-Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.**  
 Less ton lots... \$1.80 \$1.8125 \$1.8448  
 Silicaz, contract basis, f.o.b. plant freight allowed, per pound.  
 Carload lots ..... 39.00¢  
 Grainal, f.o.b. Bridgeville, Pa., freight allowed on 50 lb and over  
 No. 1 ..... 93¢  
 No. 6 ..... 63¢  
 No. 79 ..... 46¢  
 Bortram, f.o.b. Niagara Falls  
 Ton lots, per pound ..... 46¢  
 Less ton lots, per pound.... 50¢  
 Carbortam, f.o.b., Suspension Bridge, N. Y., freight allowed, Ti 15-17%, B 0.90-1.15%, Si 2.5-3.0% Al 1.0-2.0%.  
 Ton lots, per pound ..... 1.00